2010 Urban Water Management Plan

jurupa
COMMUNITY SERVICES DISTRICT

May 2011

Kennedy/Jenks Consultants

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Section 1: Introduction

1.1 Overview

This volume presents the Urban Water Management Plan 2010 (Plan) for the Jurupa Community Services District (JCSD) service area. This section describes the general purpose of the Plan, discusses Plan implementation, and provides general information about JCSD and service area characteristics. A list of acronyms and abbreviations is also provided.

1.2 Purpose

An Urban Water Management Plan (UWMP) is a planning tool that generally guides the actions of water management agencies. It provides elected officials, managers and the public with a broad perspective on a number of water supply issues. It is not a substitute for project-specific planning documents, nor was it intended to be when mandated by the State Legislature. For example, the Legislature mandated that a plan include a section which "describes the opportunities for exchanges or water transfers on a short-term or long-term basis." (California Urban Water Management Planning Act, Article 2, Section 10630(d).) The identification of such opportunities, and the inclusion of those opportunities in a general water service reliability analysis, neither commits a water management agency to pursue a particular water exchange/transfer opportunity, nor precludes a water management agency from exploring exchange/transfer opportunities not identified in the plan. When specific projects are chosen to be implemented, detailed project plans are developed, environmental analysis, if required, is prepared, and financial and operational plans are detailed.

In short, this Plan is a management tool, providing a framework for action, but not functioning as a detailed project development or action. It is important that this Plan be viewed as a long-term, general planning document, rather than as an exact blueprint for supply and demand management. Water management in California is not a matter of certainty, and planning projections may change in response to a number of factors. From this perspective, it is appropriate to look at the Plan as a general planning framework, not a specific action plan. It is an effort to generally answer a series of planning questions including:

- What are the potential sources of supply and what is the reasonable probable yield from them?
- What is the probable demand, given a reasonable set of assumptions about growth and implementation of good water management practices?
- How well do supply and demand figures match up, assuming that the various probable supplies will be pursued by the implementing agency?

Using these "framework" questions and resulting answers, the implementing agency will pursue feasible and cost-effective options and opportunities to meet demands. JCSD will explore enhancing basic supplies from traditional sources such as the State Water Project (SWP) through Western Municipal Water District (Western MWD) which is a wholesale customer of Metropolitan of Southern California (Metropolitan), a SWP contractor, as well as other options.

These include continued groundwater extraction, water exchanges, recycling, desalination, and water banking/conjunctive use. Specific planning efforts will be undertaken in regard to each option, involving detailed evaluations of how each option would fit into the overall supply/demand framework, how each option would impact the environment, and how each option would affect customers. The objective of these more detailed evaluations would be to find the optimum mix of conservation and supply programs that ensure that the needs of the customers are met.

The California Urban Water Management Planning Act (Act) requires preparation of a plan that:

- Accomplishes water supply planning over a 20-year period in five year increments. (JCSD is going beyond the requirements of the Act by developing a plan which spans 25 years.)
- Identifies and quantifies adequate water supplies, including recycled water, for existing and future demands, in normal, single-dry, and multiple-dry years.
- Implements conservation and efficient use of urban water supplies.

A checklist to ensure compliance of this Plan with the Act requirements is provided in Appendix A.

In short, the Plan answers the question: *Will there be enough water for the JCSD service area in the future years, and what mix of programs should be explored for making this water available?*

It is the stated goal of JCSD to deliver a reliable and high quality water supply for their customers, even during dry periods. Based on conservative water supply and demand assumptions over the next 25 years in combination with conservation of non-essential demand during certain dry years, the Plan successfully achieves this goal.

1.3 Implementation of the Plan

The JCSD service area served approximately 101,720 customers and supplied more than 23,660 acre-feet (AF) of water in 2009. Western MWD is the wholesaler in the region, however, JCSD does not receive water at this time from that agency, but does implement conservation programs through Western MWD. This subsection provides the cooperative framework within which the Plan will be implemented including agency coordination, public outreach, and resources maximization.

1.3.1 Joint Preparation of the Plan

Water agencies are permitted by the State to work together to develop a cooperative regional plan. JCSD coordinates with the local governments and water agencies for planning purposes. Water resource specialists with expertise in water resource management were retained to assist JCSD in preparing the details of the Plan. Agency coordination for this Plan is summarized in Table 1-1.

Table 1-1
Agency Coordination Summary

	Participated in UWMP Development	Received Copy of Draft	Commented on Draft	Attended Public Meetings	Contacted for Assistance	Sent Notice of Intent to Adopt	Not Involved
City of Eastvale		✓				✓	
City of Norco		✓				✓	
City of Ontario		✓				✓	
City of Riverside		✓				✓	
Inland Empire Utilities Agency		✓				✓	
Chino Desalter Authority		✓				✓	
Chino Basin Watermaster		✓				✓	
Rubidoux Community Services District		✓				✓	
Riverside County		✓				✓	
Santa Ana River Water Company		✓				✓	
Western MWD	✓	✓			✓	✓	

Note: the City of Jurupa Valley, was incorporated in March 2011, and does not yet have staff to consult with on this UWMP.

1.3.2 Public Outreach

JCSD has encouraged community participation in water planning. For the current Plan, one JCSD Board workshop and one JCSD Water Committee Workshop open to the public were held for review and to solicit input on the Draft Plan before the public hearing for its adoption. Interested groups were informed about the development of the Plan along with the schedule of public activities. Notices of public meetings were published in the Press-Enterprise, the local newspaper. Copies of the Draft Plan were made available at JCSD's office, and on the JCSD website. JCSD also convened meetings with various interests to gather data concerning planned development and the probable implementation of approved development. Such informed data gathering on important issues is a means of checking the short-term "reality" of official projections and understanding the concerns of various groups.

JCSD notified the cities and counties within its service area of the opportunity to provide input regarding the Plan. Table 1-2 presents a timeline for public participation during the development of the Plan. A copy of the public outreach materials, including paid advertisements, newsletter covers, website postings, and invitation letters are attached in Appendix B.

Table 1-2
Public Participation Timeline

Date	Event	Description
March 22, 2011	JCSD Water Committee Workshop	Describe UWMP requirements and process
March 23 , 2011	Public notification	Describe UWMP requirements and process
April 11, 2011	JCSD Board Workshop	Release Draft UWMP and solicit input
May 17, 2011	JCSD Water Committee	Presentation of Final Draft UWMP
May 23, 2011	Public Hearing	UWMP considered for approval by the JCSD Board

The components of public participation include:

Local Media

- Paid advertisements in local newspapers

JCSD Public Participation

- Water Committee Workshop
- Board workshop

City/County Outreach

- Notification letters

Public Availability of Documents

- JCSD website
- JCSD offices

Copies of the final document will be sent to the entities listed in Table 1-1 as well as the State of California Library.

1.3.3 Resources Maximization

Several documents were developed to enable JCSD to maximize the use of available resources, including the draft Non-Potable Water Master Plan (Webb, 2008), Non-Potable Water Evaluation in the Eastern Portion of the Jurupa Community Services District Service Area (Webb, 2010a), and Demand Analysis (Webb, 2010c). Section 3 of this Plan describes in detail the water resources available to JCSD for the 25-year period covered by the Plan. Additional discussion regarding documents developed to maximize resources is included in Section 3 and Section 6.

1.4 The JCSD Service Area

1.4.1 Location

JCSD was formed in 1956 for the purpose of providing a sewer system to the community of Jurupa. Water service with JCSD began in 1966 with the consolidation of three local agencies providing water at that time: Jurupa Heights Water Company, the La Bonita Mutual Water Company and the Monte Rue Acres Mutual Water Company. JCSD serves an area of 48 square miles in Riverside County. The service area of JCSD is shown on Figure 1-1.

JCSD relies predominantly on groundwater and desalinated brackish groundwater from the Chino Groundwater Basin. JCSD currently has 16 wells, 8 booster stations, 15 reservoirs of 53.7 million-gallon capacity. There are two small irrigation water systems located in JCSD, one in Sunnyslope and the other in Eastvale. The Board of Directors and staff, in order to ensure a continuing supply of good quality water for current citizens and also future development, participates in a Joint Powers Authority (JPA) with other neighboring water purveyors, the Chino Desalter Authority (CDA). The CDA owns and operates two water treatment plants (Desalters) for the removal of Total Dissolved Solids (TDS) and nitrates (NO3) in the Chino Basin, along with the necessary wells (22), pipelines, booster pump stations (2) and reservoirs (2) for the delivery of this highly treated water. Both Desalters utilize Reverse Osmosis (RO) and Ion Exchange (IX) treatment processes to remove the nitrates from the groundwater. The treatment capacity for each plant is 12 million gallons/day (MGD). JCSD has a contractual obligation to purchase 7.9 MGD (8,200 acre feet per year (AFY)). The CDA expanded capacity beyond the Chino I desalter by adding the Chino II Desalter which processes 10.5 MGD for a total of 22.5 MGD. The Chino II Desalter is also in the process of expanding from 10.5 MGD to 20.5 MGD of which JCSD’s contractual capacity will be 3 MGD or 3,300 AFY.

JCSD's sewer system is centered on the regional approach to treatment as a cost effective way to treat wastewater. JCSD discharges wastewater to three different treatment plants from three independent sewer systems. First, JCSD continues to utilize JCSD's Regional Lift Station to pump wastewater to the City of Riverside Regional Water Quality Control Plant. Second, the CFD No. 1 wastewater system is mostly from industrial sources and is discharged to the Inland Empire Brine Line (IEBL) formerly known as the Santa Ana River Interceptor (SARI) System for treatment in Orange County, which has higher salt limits because it is an ocean discharge. JCSD's water treatment plants also discharge brine to the IEBL to take advantage of these higher discharge limits. Finally, the Eastvale area discharges to the River Road Lift Station, which pumps the wastewater to another regional treatment plant, operated by a JPA know as the Western Riverside County Regional Wastewater Authority (WRCRWA). JCSD is a member of the WRCRWA JPA with a 3.25 MGD capacity right (Webb, 2007). JCSD proactively operates and maintains its sewer system to convey the wastewater to the treatment plants in a reliable and cost effective manner in accordance with the recently completed Sewer Master Plan which was approved by the Board of Directors on February 14, 2011.

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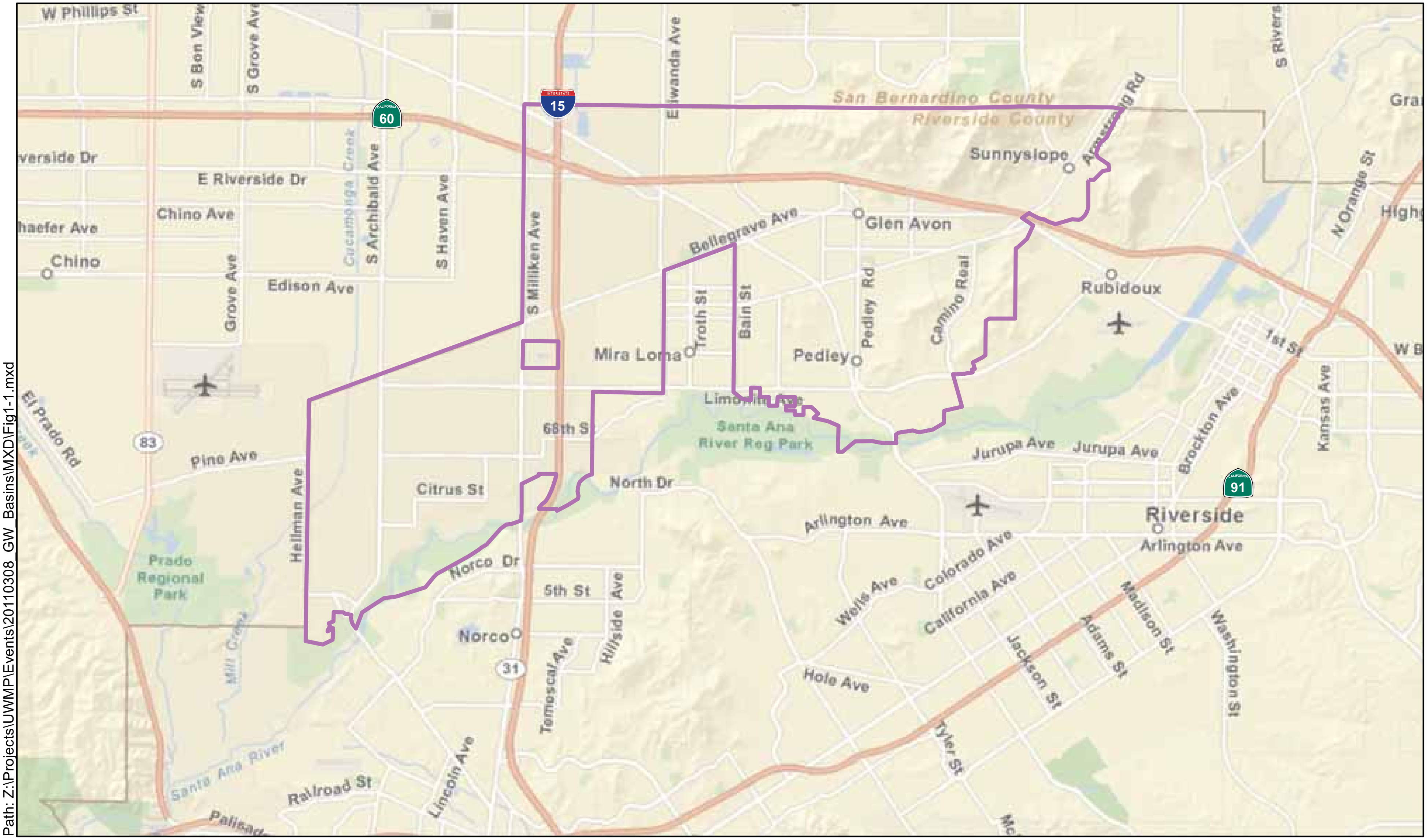

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JCSD Service Area

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JCSD-2010 UWMP Update
Riverside County, California

Service Area

K/J 1088021*00
May 2011

Figure 1-1

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1.5 Climate

The climate of JCSD's service area is generally semi-arid and warm. Summers are dry with average temperatures as high as 92°F and maximum temperatures that sometimes exceed 100°F. Winters are somewhat cool with average temperatures as low as 40°F. Average rainfall is almost 13" per year. The region is subject to wide variations in annual precipitation and also experiences periodic wildfires. Table 1-3 presents the region's annual average climate data. Standard Monthly Average data was generated from the Western Regional Climate Center data. Average Monthly Rainfall and Average Maximum Temperature data are provided for 1908 – 1988 at the Corona station.

Table 1-3
Climate Data for the JCSD Service Area

	Jan	Feb	Mar	Apr	May	Jun
Standard Monthly Average ETo[a]	2.49	2.91	4.16	5.27	5.94	6.56
Average Rainfall (inches) [b]	2.61	2.62	2.00	0.98	0.26	0.04
Average Max. Temperature (Fahrenheit) [c]	65.3	67.7	70.5	74.9	79.3	85.5

	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Standard Monthly Average ETo[a]	7.22	6.92	5.35	4.05	2.94	2.56	56.37
Average Rainfall (inches)[b]	0.02	0.09	0.25	9.55	1.14	2.15	12.71
Average Max. Temperature (Fahrenheit) [c]	92.3	92.2	89.1	81.6	73.5	66.8	78.2

a. ETo (evapotranspiration) data from Station #44 UC Riverside, http://wwwcimis.water.ca.gov/cimis/welcome.jsp
b. Average Monthly Rainfall data gathered from long-term average precipitation records from Corona, CA Station number 042031 during period 1908-1988.
c. Temperature data provided for Corona, CA Station number 042031, http://www.wrcc.dri.edu/CLIMATEDATA.html

1.6 Potential Effects of Global Warming

A topic of growing concern for water planners and managers is global warming and the potential impacts it could have on California's future water supplies. DWR's Draft California Water Plan Update 2005 contains the first-ever assessment of such potential impacts in a California Water Plan.

Volume 1, Section 4 of the California Water Plan, "Preparing for an Uncertain Future," lists some potential impacts of global warming, based on more than a decade of scientific studies on the subject:

- Could produce hydrologic conditions, variability, and extremes that are different from what current water systems were designed to manage
- May occur too rapidly to allow sufficient time and information to permit managers to respond appropriately
- May require special efforts or plans to protect against surprises or uncertainties

Should global warming increase over time, it may cause a number of changes impacting future water supplies, including changes in Sierra snowpack patterns (the source of the SWP's water supply to Metropolitan for the recharge of the Chino Basin), hydrologic patterns, sea level, rainfall intensity, and statewide water demand. Computer models (such as CALVIN) have been developed to show water planners how California water management might adapt to climate change. DWR has committed to continue to update and refine these models based on ongoing scientific data collection and to incorporate this information into future California Water Plans. As DWR develops more specific assessments of the potential effects of climate change on SWP delivery reliability, local water reliability, and water demands, JCSD can update its plans accordingly.

1.7 Other Demographic Factors

Water service is provided to residential, commercial, industrial, institutional, recreational, and agricultural customers and for environmental and other uses, such as fire protection and pipeline cleaning.

Recently, the service area (along with most of California) has experienced significant increases in both single family residential construction, especially in the Eastvale area. As the local population has increased, the demand for water has also increased. Although JCSD has seen some decline in demands, most likely linked to both a rate increase and the recent economic downturn, JCSD continues to see some development activity in the near-term.

1.8 List of Abbreviations and Acronyms

The following abbreviations and acronyms are used in this report.

1,2,3-TCP	1,2,3-Trichloropropane
20x2020 Plan	20x2020 Water Conservation Plan
AB	Assembly Bill
ACOE	U.S. Army Corps of Engineers
Act	California Urban Water Management Planning Act
AF	AF
AFY	AF per year
AWWARF	American Water Works Association Research Foundation
Basin	Chino Basin
BMPs	Best Management Practices
CBWM	Chino Basin Watermaster
CCF	One Hundred Cubic Feet
CCR	Consumer Confidence Report
CDA	Chino Desalter Authority
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CII	Commercial, Industrial, and Institutional

COG	Council of Governments
CUWCC	California Urban Water Conservation Council
DBP	Disinfection by-products
DMM	Demand Management Measures
DOF	Department of Finance
DPH	Department of Public Health
DTSC	Department of Toxic Substances Control
DWR	California Department of Water Resources
DYY	Dry Year Yield
EC	Electrical conductivity
EIR/EIS	Environmental Impact Report/Environmental Impact Statement
EPA	Environmental Protection Agency
ETo	Evapotranspiration
gpcd	gallons per capita per day
gpd	gallons per day
gpm	gallons per minute
GRCC	Groundwater Recharge Coordinating Committee
GWMP	Groundwater Management Plans
HCD	Housing and Community Development
HCF	Hundred Cubic Feet
HECW	High Efficiency Clothes Washer
HET	High Efficiency Toilet
IEBL	Inland Empire Brine Line
IEUA	Inland Empire Utilities Agency
IX	Ion Exchange
JCSD	Jurupa Community Services District
JPA	Joint Powers Authority
MCL	Maximum Contaminant Level
M&I	Municipal and Industrial
Metropolitan	Metropolitan of Southern California
MGD	million gallons per day
mg/L	milligrams per liter
MOU	Memorandum of Understanding Regarding Water Conservation in California
NPDES	National Pollutant Discharge Elimination System
NO3	Nitrates
OBMP	Optimum Basin Management Plan
Plan	Urban Water Management Plan 2005
ppb	parts per billion
PUC	California Public Utilities Commission
RAP	Remedial Action Plan
RHNA	Rural Housing Needs Allocation
RO	Reverse Osmosis

RPU	Riverside Public Utilities
RTP	Regional Transportation Plan
Rubidoux CSD	Rubidoux Community Services District
RWQCB	Regional Water Quality Control Board
RWQCP	Regional Water Quality Control Plant
SARI	Santa Ana River Interceptor
SBVMWD	San Bernardino Valley Municipal Water District
SARWC	Santa Ana River Water Company
SBX7-7	Senate Bill 7 of Special Extended Session 7
SCAG	Southern California Association of Governments
SWP	State Water Project
TDS	Total Dissolved Solids
TOC	Total Organic Carbon
UAW	Unaccounted For Water
umhos/cm	Micromhos per centimeter
UWMP	Urban Water Management Plan
VOC	Volatile Organic Compound
Watermaster	Chino Basin Watermaster
Western MWD	Western Municipal Water District
WRCWRA	Western Riverside County Regional Wastewater Authority
WSS	WaterSense Specification

Section 2: Water Use

2.1 Overview

This section describes historic and current water usage and the methodology used to project future demands within JCSD's service area. Water usage is divided into sectors such as residential, industrial, institutional, landscape, agricultural, and other purposes. JCSD commissioned Albert A. Webb Associates (Webb Associates) to prepare an independent potable Demand Analysis which was completed in November 2010 which serves as the basis for the demand analysis in this section. To undertake the demand analysis, existing land use, new housing construction information, and vacant land that will be developed based on the Riverside County's General Plan were compiled. Current actual demand served as the basis to calculate water unit factors for each land use type. The number of new connections based on the land use type was projected out based on the time to development in the General Plan.

Several factors can affect demand projections, including:

- Land use revisions
- New regulations
- Increases in water rates
- Consumer choice
- Economic conditions
- Transportation needs
- Highway construction
- Environmental factors
- Conservation programs
- Plumbing codes

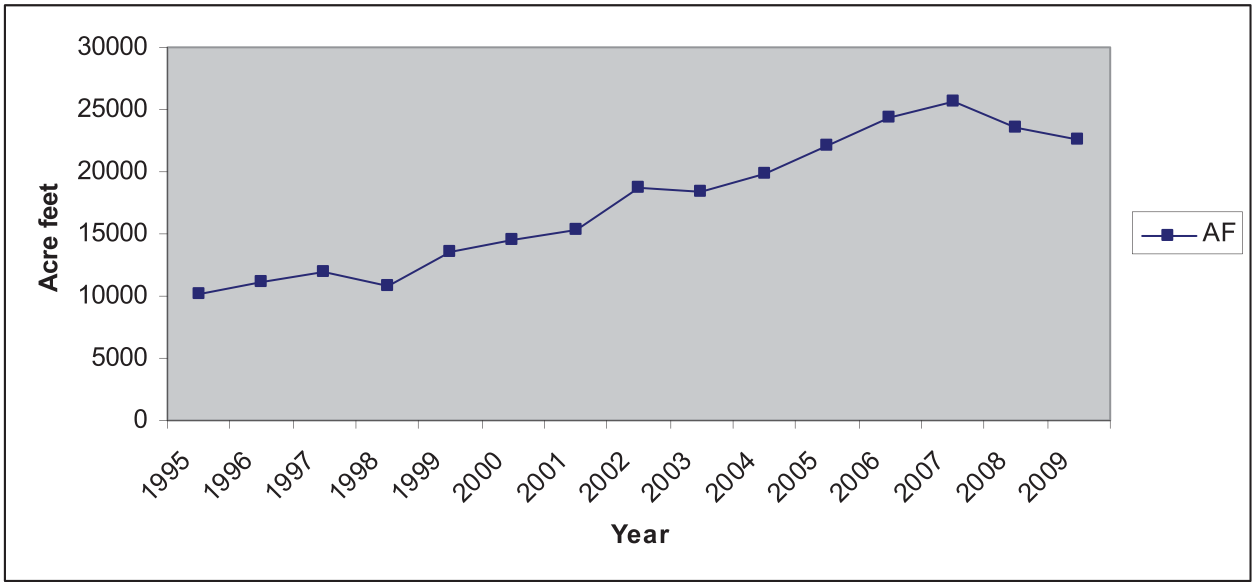
The foregoing factors affect the amount of water needed, as well as the timing of when it is needed. Past experience has indicated that the economy is the biggest factor in determining water demand projections. During an economic recession, there is a major downturn in development and a subsequent slowing of the projected demand for water. The projections in this Plan do not attempt to forecast recessions or droughts. Likewise, no speculation is made about future plumbing codes or other regulatory changes. However, the projections do include water conservation. There have been, and continue to be, major efforts statewide to conserve water, which have been successful.

2.2 Historic Water Use

Predicting future water supply requires accurate historic water use patterns and water usage records. Both the economy and entitlement process (compliance with the California Environmental Quality Act [CEQA]) are key factors impacting growth in population and demand.

Figure 2-1 presents the historical production of both groundwater as well as imported water purchases by JCSD since 1990 (Webb, 2010b). The water serves a range of customer types including single family homes, multi-family homes, commercial, industrial, institutional/government, landscape and agriculture. A more detailed breakdown by customer classification is found in Tables 2-1 and 2-3.

Figure 2-1 Historical Groundwater Production and Imported Water Purchases



2.3 Projected Water Use

2.3.1 Projections

JCSD maintains historical data, as well as works closely with property owners and developers in their service areas, to ensure they have an adequate water supply and the necessary infrastructure to provide water service. Table 2-1 is based on the most recent Demand Analysis JCSD performed in November 2010 and summarizes projected water demands through 2035. Table 2-2 provides an estimate of population projections through 2035 in the JCSD service area which were derived from recent demographic information and demand projections (Webb, 2010c).

Table 2-3 presents the past, current and projected potable water delivery by customer type for the JCSD Service Area.

Table 2-1

Current and Projected Water Demands for Each Customer Class, Potable and Non-potable Water

Projected Demand for Customer Class	2009	2015	2020	2025	2030	2035
Single family	14,069	17,081	20,118	20,469	20,838	21,190
Multi-family	851	947	1,109	1,128	1,148	1,166
Commercial	1,916	2,757	3,227	3,281	3,339	3,393
Industrial	851	1,182	1,383	1,407	1,431	1,454
Institutional / governmental	639	802	939	955	971	987
Landscape	2,556	2,841	3,326	3,382	3,442	3,497
Agricultural (non-potable)[(a)]	626	720	720	720	720	720
Subtotal[a]	**21,509**	**26,330**	**30,822**	**31,342**	**31,888**	**32,407**
Unaccounted for Water (UAW) (10%)	2,151	2,633	3,082	3,134	3,189	3,241
Total Water Demand	**23,660[(b)]**	**28,962[(c)]**	**33,905[(c)]**	**34,476[(c)]**	**35,077[(c)]**	**35,648[(c)]**

a. JCSD agricultural meters are associated with non-potable use from non-potable wells.
b. Potable Production from Water Demand Study, Table 8 (Webb, 2010c and 3/31/11 personal communicat Water Portfolio December 2010
c. Potable Demand from Webb 2010 Water Demand Study, Table 10

Table 2-2

Current and Projected Population in JCSD Service Area

2009	2015	2020	2025	2030	2035
101,700	113,800	130,400	132,500	134,800	137,000

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Table 2-3
Current and Projected Water Demands for Potable Supply

	2005				2009				2015				2020			
	metered		unmetered		metered		unmetered		metered		unmetered		metered		unmetered	
Water Use Sectors	# of accounts	Deliveries AFY	# of accounts	Deliveries AFY	# of accounts	Deliveries AFY	# of accounts	Deliveries AFY	# of accounts	Deliveries AFY	# of accounts	Deliveries AFY	# of accounts	Deliveries AFY	# of accounts	Deliveries AFY
Single family	13121	15439	0	0	25,159	14,069	0	0	30,079	17,081	0	0	36,300	20,118	0	0
Multi-family	125	882	0	0	268	851	0	0	320	947	0	0	386	1,109	0	0
Commercial	323	1764	0	0	455	1,916	0	0	544	2,757	0	0	656	3,227	0	0
Industrial	87	882	0	0	134	851	0	0	160	1,182	0	0	193	1,383	0	0
Institutional/ governmental	37	662	0	0	80	639	0	0	96	802	0	0	116	939	0	0
Landscape	334	2206	0	0	562	2,556	0	0	672	2,841	0	0	811	3,326	0	0
Agriculture (Non-potable)	81	221	0	0	7	626	0	0	7	720	0	0	7	720	0	0
other			0	0			0	0			0	0			0	0
Total	14,108	22,056	0	0	26,665	21,509	0	0	31,878	26,330	0	0	38,469	30,822	0	0

	2025				2030				2035			
	metered		unmetered		metered		unmetered		metered		unmetered	
Water Use Sectors	# of accounts	Deliveries AFY	# of accounts	Deliveries AFY	# of accounts	Deliveries AFY	# of accounts	Deliveries AFY	# of accounts	Deliveries AFY	# of accounts	Deliveries AFY
Single family	37,019	20,469	0	0	37,738	20,838	0	0	38,457	21,190	0	0
Multi-family	394	1,128	0	0	401	1,148	0	0	409	1,166	0	0
Commercial	669	3,281	0	0	682	3,339	0	0	696	3,393	0	0
Industrial	197	1,407	0	0	201	1,431	0	0	205	1,454	0	0
Institutional/ governmental	118	955	0	0	120	971	0	0	123	987	0	0
Landscape	827	3,382	0	0	843	3,442	0	0	859	3,497	0	0
Agriculture (Non-potable)	7	720	0	0	7	720	0	0	7	720	0	0
other			0	0			0	0			0	0
Total	39,231	31,342	0	0	39,992	31,889	0	0	40,756	32,407	0	0

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2.3.2 Projections Based On Service Area Growth

2.3.3 Methodology

JCSD has commissioned various studies and analysis for the supply and demands within the service area to address the tremendous growth the region has seen. The studies utilized data to assess the continued growth in the region.

Customer Classification

To divide the overall demand provided in the November 2010 Demand Analysis study amongst customer class as required by the UWMP, the 2005-2009 meter data was used to estimate percent representation across the various classes (Table 2-4). The percentage of each classification was calculated based on both connections and demand. It was found that single family residential represents 94% of the connections but only 70% of the water demand. Multi-family connections are estimated at 1% of total connections and 4% of the demand. "Other-Hydrant meters" represents a classification for temporary sales and is not a consistent annual delivery and was not included since this use is negligible. For the purposes of distributing overall demand amongst customer classification, the percent distribution based on demand values not connection values was used.

Table 2-4
Regrouping for UWMP Classifications

Class	JCSD meter code and type	Percent representation based on 2009 connections	Percent representation based on 2009 demand
Single family	0-Residential SF	94%	70%
Multi-family	7- Multiple Residential	1%	4%
Commercial	1-Department/Retail Stores	1.7%	8%
	10- Restaurants		
	11- Churches and Halls – Potable		
	13- Markets		
	14- Non-Residential		
	15- Repair Shops and Services		
	16- Commercial/Warehouse		
	17- Hotels and Motels		
	18- Wholesale Bakery		
	19- Professional Offices		
Industrial	2-Industrial Potable	0.5%	4%
Institutional / governmental	8- Public Authority	0.3%	3%
	12- Hospitals and Convalescent		
Landscape	5- Treated Irrigation	2.1%	10%
	9- Landscape		
Agricultural	20- Agricultural-Well Develop	0.4%	1%
	3- Agricultural-Non-Potable		
Other- temporary sales	6- Other-Hydrant Meters		

As the service area grows, the percent allotted to each classification may change from the current meter data. To evaluate the impact of potential changes to the classification percentages, the current and projected developments within the region based on the November 2010 Demand Analysis study were grouped by customer class. The percent of each customer class at build out (2040) was calculated and is presented in Table 2- 5. Very little change occurs within the customer classifications. However, residential classifications are expected to become slightly less represented in the service area and a slight increase in commercial property representation is expected in the service area.

Table 2-5
Percent of Demand at the Ultimate Build Out (2040) by Customer Class

* Includes 10% UAW distributed throughout customer classes

Customer class	2009 demand	Future Demand from Known Current Develop-ment (AF/yr)	Future Demand from WRCRWA Tributary Area (AF/yr)	Future Demand from OCSD/ SARI Tributary Area (AF/yr)	Future Demand from City of Riverside WWTP Tributary Area (AF/yr)	Total Future Demand (AF/yr)	Percent of demand at the ultimate build out	Percent of demand 2009
Single family	15379*	5980	901		1090	23350	64%	70%
Multi-family	946*	368				1314	4%	4%
Commercial	2129*	828	255	97	516	3825	10%	8%
Industrial	946*	368	147	96	82	1639	5%	4%
Institutional/ Governmental	710*	276	1		126	1113	3%	3%
Landscape	2839*	1104				3943	11%	10%
Agricultural	710*	276				986	3%	1%
Total	23660*	9200	1304	193	1814	36171	100%	100%

2.4 Water Conservation Act of 2009

2.4.1 SBX7-7

As described in Senate Bill 7 of Special Extended Session 7 (SBX7-7), it is the intent of the California legislature to increase water use efficiency and the legislature has set a goal of a 20 percent per capita reduction in urban water use statewide by 2020. SBX7-7 requires that retail water suppliers comply with its requirements. Consistent with SBX7-7, the 2010 UWMP must provide an estimate of Base Daily Per Capita Water Use. This estimate utilizes information on population as well as base gross water use. For the purposes of this UWMP, population was estimated as described in the previous section. Base gross water use is defined as the total volume of water, treated or untreated, entering the distribution system, excluding: recycled water; net volume of water placed into long-term storage; and water conveyed to another urban water supplier.

The UWMP Act allows urban water retailers to evaluate their base daily per capita water use using a 10 or 15-year period. A 15-year base period within the range January 1, 1990 to December 31, 2010 is allowed if recycled water made up 10 percent or more of the 2008 retail water delivery. If recycled water did not make up 10 percent or more of the 2008 retail water delivery, then a retailer must use a 10-year base period within the range January 1, 1995 to December 31, 2010. Recycled water did not make up 10 percent of the 2008 delivery to and for this reason Base Daily Per Capita Water Use has been based on a 10-year period. In addition, urban retailers must report daily per capita water use for a five year period within the range January 1, 2003 to December 31, 2010. This 5-year base period is compared to the Target Based Daily Per Capita Water Use to determine the minimum water use reduction requirement.

Table 2-6 summarizes the gallons per capita per day (gpcd) for compliance with SBX7-7. The population was calculated using the 2000 Census data and the method found in Appendix A of methodologies for *Calculating Baseline and Compliance Urban Per Capita Water Use* from the DWR UWMP Guidebook. Deliveries were obtained from the PWSS reports submitted to DWR. The 2009 estimated water use is 197.6 gpcd. The calculated baseline is 248.3 gpcd with a 2020 target of 198.6 gpcd.

Table 2-6
Base Period Ranges

Base	Parameter	Value	Units
10-15 year base period	2009 total water deliveries [a]	22,518	AF
	2009 total volume of delivered recycled water	0	AF
	2009 recycled water as a percent of total deliveries	0	percent
	Number of years in base period	10	years
	Year beginning base period range	1999	
	Year ending base period range	2008	
5-year base period	Number of years in base period	5	years
	Year beginning base period range	2003	
	Year ending base period range	2007	

a. Per Public Water Supply Survey Report for 2009

In addition to calculating base gross water use, SBX7-7 requires that JCSD identify their demand reduction targets for year 2015 and 2020 by utilizing one of four options:

- Option 1. 80% of baseline gpcd water use (i.e., a 20% reduction).
- Option 2. The sum of the following performance standards: indoor residential use (provisional standard set at 55 gpcd); plus landscape use, including dedicated and residential meters or connections equivalent to the State Model Landscape Ordinance (80% ETo existing landscapes, 70% of ETo for future landscapes); plus 10% reduction in baseline commercial, industrial institutional use by 2020.
- Option 3. 95% of the applicable state hydrologic region target as set in the DWR "20x2020 Water Conservation Plan" (February, 2010) (20x2020 Plan).
- Option 4. Savings by Water Sector: this method identifies water savings obtained through identified practices and subtracts them from the base daily per capita water use value identified for the water supplier.

Option 2 and Option 4 were considered and not selected because they required data not currently being collected within the JCSD service area.

The JCSD service area is within the South Coast Hydrologic Region (#4) as defined by DWR and this hydrologic region has been assigned a 2020 water use target of 149 gpcd per the DWR 20x2020 Water Conservation Plan (February 2010). Therefore, in order to use Option 3, JCSD's daily per capita water use for the 5-year base period would have to be close to 95% of the 149 gpcd target, or 142 gpcd. Since JCSD's 5-year base period is within this limit, JCSD did not choose this option to reduce demand.

Option 1 is the simplest of the options provided and requires an 80 percent reduction in baseline per capita water use. Option 1 is also the most conservative of the four Options provided. For these reasons JCSD selected Option 1 to comply with the SBX7-7 targe and the 2020 target is 198.6 gpcd.

This results in the 2020 gpcd targets for JCSD as shown in Tables 2-7 to 2-8.

Table 2-7
Base Daily Per Capita Water Use 10 to 15- Year Range

Base Period Year		Distribution System Population	Daily System Gross Water Use (MGD)	Annual Daily Per Capita Water Use (gpcd)
Sequence year	Calendar Year			
Year 1	1995	40,512	9	222.9
Year 2	1996	41,900	10	238.5
Year 3	1997	44,377	11	238.8
Year 4	1998	45,194	10	214.5
Year 5	1999	46,620	12	259.1
Year 6	2000	48,896	13	264.0
Year 7	2001	51,172	14	268.5
Year 8	2002	58,832	17	283.8
Year 9	2003	65,717	16	250.6
Year 10	2004	77,254	18	229.1
Year 11	2005	84,294	20	233.6
Year 12	2006	91,333	22	237.4
Year 13	2007	95,342	23	239.7
Year 14	2008	97,061	21	217.0
Year 15	2009	101,721	20	197.6
			Base Daily Per Capita Water Use	248.3

Table 2-8
Base Daily Per Capita Water Use 5 Year Range

Base Period Year		Distribution System Population	Daily System Gross Water Use (MGD)	Annual Daily Per Capita Water Use (gpcd)
Sequence year	Calendar Year			
Year 1	2003	65,717	16	250.6
Year 2	2004	77,254	18	229.1
Year 3	2005	84,294	20	233.6
Year 4	2006	91,333	22	237.4
Year 5	2007	95,342	23	239.7
			Base Daily Per Capita Water Use	238.1

The baseline and 2020 target is presented in Table 2-9. To date, JCSD has met the 2020 target and intends to maintain this target as presented in Section 7.

Table 2-9
Baseline, Target, and Current gpcd

Basis	gpcd
Baseline	248.3
Target 2020	198.6
Interim Target 2015	223.5
Current 2009	197.6

2.5 Other Factors Affecting Water Usage

Major factors that affect water usage are weather and water conservation. Historically, when the weather is hot and dry, water usage increases. The amount of increase varies according to the number of consecutive years of hot, dry weather and the conservation activities imposed. During cool-wet years, historical water usage has decreased to reflect less water usage for external landscaping. Water conservation measures employed within the JCSD service area have a direct long-term effect on water usage. Furthermore, JCSD implemented a rate structure in 2009 that also has contributed to reduction in water usage.

2.5.1 Conservation Effects on Water Usage

In recent years, water conservation has become an increasingly important factor in water supply planning in California. The California plumbing code has instituted requirements for new construction that mandate the installation of ultra low-flow toilets and low-flow showerheads. JCSD continues to support the development of water conservation measures that include public information and education programs. JCSD provides information regarding rebates from Metropolitan and Western MWD to its customers.

Residential, commercial, and industrial usage can be expected to decrease as a result of the implementation of more aggressive water conservation practices. The greatest opportunity for conservation is in developing greater efficiency and reduction in landscape irrigation especially in JCSD's service area where the evapotranspiration rate is high. The irrigation demand can represent as much as 50 percent of the water demand for residential customers depending upon the size of the property, the type of landscape, and whether the property has water features or large livestock.

2.6 Low Income Projected Water Demands

Senate Bill 1087 requires that water use projections of a UWMP include the projected water use for single-family and multi-family residential housing for lower income households as identified in the housing element of any city, county, or city and county general plan in the service area of the supplier.

Housing elements rely on the Regional Housing Needs Allocation (RHNA) generated by the State Department of Housing and Community Development (HCD) to allocate the regional need for housing to the regional Council of Governments (COG) (or a HCD for cities and counties not covered by a COG) for incorporation into housing element updates. Before the housing element is due, the HCD determines the total regional housing need for the next planning period for each region in the state and allocates that need. The COGs then allocate to each local jurisdiction its "fair share" of the RHNA, broken down by income categories; very low, low, moderate, and above moderate, over the housing element's planning period.

Jurisdictions located within the region covered by the Southern California Association of Governments (SCAG) were required to submit their adopted Housing Elements to the State Department of Housing and Community Development by July 1, 2008.

The housing elements cover the planning period 2008-2014. The allocation for very low and low income classes as defined by the California Health and Safety Code were the following for unincorporated areas of Riverside County:

- Very Low – 23.7%
- Low – 16.4%

The SCAG RHNA classify the allocation of low income households into single-family and multi-family residential housing units. For this reason, it is not possible to project water use for lower income households by this specific land use category. However, to remain consistent with the intent of the SB1087 legislation and also to comply with the UWMP Planning Act, intent has been made to identify those water use projections for very low- and low- residential income households based on the income category, classification percentage, calculated demand projections as shown in Table 2-10 below.

Note that the current planning period for the RHNA is January 1, 2006 to June 30, 2014. The next RHNA planning cycle will cover January 1, 2011 to September 30, 2021. Thus, the 2015 UWMP update will need to be updated with the next RHNA planning cycle and allocation of low income category percentages. Also the 2015 UWMP update will need to account for the recently incorporated cities of Jurupa Valley and Eastvale.

JCSD will not deny or condition approval of water services, or reduce the amount of services applied for by a proposed development that includes housing units affordable to lower income households.

Table 2-10

Low Income Water Demand

	2010	2015	2020	2025	2030	2035
Demand[a]	23,660	28,962	33,905	34,476	35,077	35,648
Very low income[b]	5,607	6,864	8,035	8,171	8,313	8,449
Low income[b]	3,880	4,750	5,560	5,654	5,753	5,846
Total	9,488	11,614	13,596	13,825	14,066	14,295

a. Demand from Table 2-1

b. Final Regional Housing Need Allocation Plan - Planning Period (January 1, 2006 - June 30, 2014) for Jurisdictions within the Six-County SCAG Region (approved by the SCAG Regional Council on July 12, 2007); http://www.scag.ca.gov/housing/pdfs/rhna/RHNA_FinalAllocationPlan071207.pdf

Section 3: Water Resources

3.1 Overview

This section describes the water resources available to JCSD for the 25-year period covered by the Plan. These are summarized in Table 3-1 and discussed in more detail below. Both currently available and planned supplies are discussed.

The term "dry" is used throughout this section and in subsequent sections concerning water resources and reliability as a measure of supply availability. As used in this Plan, dry years are those years when supplies are the lowest, which occurs primarily when precipitation is lower than the long-term average precipitation. The impact of low precipitation in a given year on a particular supply may differ based on how low the precipitation is, or whether the year follows a high-precipitation year or another low-precipitation year. For the SWP, a low-precipitation year may or may not affect supplies, depending on how much water is in SWP storage at the beginning of the year. Also, dry conditions can differ geographically. For example, a dry year can be local to the Chino Basin area (thereby affecting local groundwater replenishment and production), local to northern California (thereby affecting SWP water deliveries), or statewide (thereby affecting both local groundwater and the SWP). When the term "dry" is used in this Plan, statewide drought conditions are assumed, affecting both local groundwater and SWP supplies at the same time. JCSD does not rely on imported water from the SWP as part of their supply. The dominant supply is from local groundwater however, the groundwater basin is recharged from surface supplies. The Chino Basin Watermaster (Watermaster) is the overseeing agency for recharging and preventing overdraft within the Chino Basin. The Chino Basin Watermaster recharges the Chino Basin from the following sources: stormwater recharge, SWP water, and recycled water. SWP water is available from Metropolitan.

Table 3-1
Summary of Current and Planned Water Supplies (AFY)

Water Supply Sources	2009	2015	2020	2025	2030	2035
Supplier Produced Potable Groundwater from Chino Basin [a]	13,586	13,805	13,748	12,819	11,920	10,491
Desalination - Existing CDA Purchase [b]	8,676	8,200	8,200	8,200	8,200	8,200
Desalination - Future CDA Purchase[b]	-	3,300	3,300	3,300	3,300	3,300
Future Transfer from Metropolitan/Western MWD [c]	-	-	5,000	6,500	8,000	10,000
Supplier Surface Diversions	0	0	0	0	0	0
Current Transfers from Rubidoux [d]	679	500	500	500	500	500
Future Transfers from Rubidoux [d]		1,000	1,000	1,000	1,000	1,000
Exchanges In or out	0	0	0	0	0	0
Other						
Total Potable	**22,941**	**26,805**	**31,748**	**32,319**	**32,920**	**33,491**
Chino Basin - Existing Non-Potable Groundwater [e]	212	200	200	200	200	200
Groundwater - Non-Potable (Riverside Basin) [f]	507	600	600	600	600	600
Non-potable groundwater (Future Chino Basin) [g]	-	857	857	857	857	857
Recycled Water (projected use) [h]	-	500	500	500	500	500
Total Non-Potable	**719**	**2,157**	**2,157**	**2,157**	**2,157**	**2,157**
Total Water Supply[i]	**23,660**	**28,962**	**33,905**	**34,476**	**35,077**	**35,648**
Total Potential Production Capacity[j]	41,900	54,000	54,000	54,000	54,000	54,000

a. Potable groundwater pumping from the Chino Basin pursuant to the Judgment found in Appendix C.
b. Existing CDA pumping as reported in the Dec 2010 JCSD Water Porfolio.xls; Existing CDA includes 3,200 AFY from Chino I Desalter and 5,000 AFY from Chino II Desalter. Future CDA includes 3,300 AFY from Chino II Desalter Expansion.
c. Represents potential demand projections on WMWD for JCSD (JCSD, 2010a).
d. Existing and future transfer from Rubidoux CSD (Personal Communcation, 1/31/11)
e. Portion of non-potable irrigation pumping supplied by non-potable wells in Chino Basin. (JCSD, 2010b)
f. JCSD non-potable Well 21 and Well 5 in the Riverside Basin serving Oak Quarry Golf Course. (JCSD, 2010b).
g. Planned potable to non-potable water conversion. (Webb, 2008)
h. Planned conversion from non-potable groundwater to non-potable recycled water in Jurupa Eastside area (Webb. 2010b)
i. Projected demand as presented in Section 2.
j. Potential Potable Groundwater Capacity for Maximum Day production.

3.2 Wholesale (Imported) Water Supplies

3.2.1 Imported Water Supplies

As of the date of this UWMP, JCSD has no existing imported water supplies.

JCSD is currently pursuing an option to acquire up to 10,000 AFY from Western MWD through the proposed Riverside-Corona Feeder Project. This proposed connection to Western MWD is anticipated to be constructed by 2020 and will provide an additional source of water for JCSD. This additional source of water is anticipated to increase gradually from 5,000 AFY in 2020 to 10,000 AFY in 2035 (Table 3-2). The Draft Supplemental Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the Riverside-Corona Feeder Pipeline Project was released for public comments on January 20, 2011. The project will allow Western MWD to purchase SWP water when it is available from Metropolitan, and store that water in the San Bernardino Groundwater Basin when it is available during wet years and extract the water from this basin when it is needed in years of drought. JCSD's point of connection to the Riverside-Corona Feeder will be at the intersection of Limonite Avenue and Clay Street. In addition to the connections to JCSD's pipeline facilities, this project will include connections to San Bernardino Valley Municipal Water District's Inland and Central Feeder and other existing Western MWD facilities and will allow Western MWD to deliver a range of water supplies to JCSD.

Table 3-2
Current and Planned Imported Water Supplies (AFY)

Water Supply Sources	2010	2015	2020	2025	2030	2035
Metropolitan/Western MWD	0	0	5,000	6,500	8,000	10,000

3.3 Groundwater

This section presents information about JCSD's groundwater supplies, including a summary of the Chino Groundwater Basin (Chino Basin or Basin) and the Riverside Groundwater Basin (Riverside Basin). Groundwater supplies in the JCSD service area include three sources to meet both potable and non-potable water demand:

- Groundwater pumping from the Chino Basin for potable and non-potable use
- Groundwater extracted from the Chino Basin and treated by Chino I and II Desalters
- Groundwater pumping from the Riverside Basin for non-potable use

Groundwater pumping from the Chino Basin and Riverside Basin are described in this section. Groundwater extracted from the Chino Basin through the Chino I and II Desalters are discussed in Section 3.6 Development of Desalination.

3.3.1 Chino Groundwater Basin Description

The primary source of local groundwater for urban water supply in the JCSD service area is the Chino Groundwater Basin, identified in the DWR Bulletin 118, 2003 Update as the Chino Subbasin (No. 8-1.01) which is a part of the Upper Santa Ana Valley Groundwater Basin. The Chino Basin is the largest groundwater basin in the Upper Santa Ana River Watershed, consisting of approximately 154,000 acres, or 240 square miles (DWR, 2003). The majority of JCSD's 48 square mile service area overlies the Chino Basin as shown on Figure 3-1. The remainder of JCSD's service area overlies the Riverside Groundwater Basin. JCSD has rights to groundwater pumping in the Chino Basin through the adjudication and to contract amounts of the Chino Desalters as described in section 3.3.1.3.

Figure 3-1 shows the boundaries of the Chino Basin, the Riverside Basin, and the service area for JCSD. The Chino Basin is located within portions of the Counties of San Bernardino, Riverside, and Los Angeles. It is bounded on the east by the Rialto-Colton fault; on the southeast by the contact with impermeable rocks forming the Jurupa Mountains and low divides connecting the exposures. On the south, the basin is bounded by contact with impermeable rocks of the Puente Hills and by the Chino fault; on the northwest by the San Jose fault; and on the north by impermeable rocks of the San Gabriel Mountains and by the Cucamonga fault (DWR, 2003). San Antonio Creek and Cucamonga Creek drain the surface of the basin southward to join Santa Ana River. Annual mean precipitation ranges from 13 to 29 inches across the surface of the basin and averages about 17 inches (DWR, 2003).

The water-bearing units in the Chino Basin include the Older Alluvium of Pleistocene and Younger Alluvium of Holocene age. Older Alluvium is exposed mainly in the northern part of the Chino Basin and supplies most of the water to wells. It varies in thickness from about 200 feet thick near the southwestern end of Chino Basin to over 1,100 feet thick southwest of Fontana, and averages about 500 feet throughout the basin. Pumping capacities of wells completed in the Older Alluvium generally range between 500 and 1,500 gallons per minute (gpm). In the southern part of the basin where sediments tend to be more clayey, wells generally yield 100 to 1,000 gpm.

The Younger Alluvium occupies streambeds, washes, and other areas of recent sedimentation. The Younger Alluvium varies in thickness from over 100 feet near the mountains to a just few feet south of Interstate 10, and generally covers most of the north half of the basin in undisturbed areas. The Younger Alluvium is not saturated and thus does not yield water directly to wells. Water percolates readily in the Younger Alluvium and most of the large spreading basins in Chino Basin are located in the Younger Alluvium (Wildermuth Environmental Inc., 2007).

The saturated sediments in the Chino Basin include a shallow aquifer system and at least one deep aquifer system. The shallow aquifer system is generally characterized by unconfined to semi-confined groundwater conditions, high permeability within its sand and gravel units, and high concentrations of dissolved solids and nitrate (especially in southern portions of Chino Basin). The deep aquifer system is generally characterized by confined groundwater conditions, lower permeability within its sand and gravel units, and lower concentrations of dissolved solids and nitrate. Where depth-specific data are available, piezometric head tends to be higher in the shallow aquifer system, indicating a downward vertical hydraulic gradient (Wildermuth Environmental Inc., 2007).

While still considered a single basin for hydrologic purposes, the Chino Basin can be hydrologically subdivided into at least five flow systems that act as separate and distinct hydrologic units. Each flow system can be considered a management zone. Each management zone has a unique hydrology, and water resource management activities that occur in one management zone have limited impact on the other management zones.

3.3.1.1 Chino Basin Watermaster and Optimum Basin Management Program

The Chino Basin was adjudicated in 1978 pursuant to a Judgment entered in the Superior Court of the State of California for the County of San Bernardino. Pumping within the basin is managed and reported by the Watermaster. The Judgment is attached as Appendix C (on CD). Groundwater management activities of the Chino Basin are implemented through an Optimum Basin Management Program (OBMP) that was developed for the Chino Basin in 2000, pursuant to the Judgment. Pursuant to the Judgment, the Watermaster files an annual report of Watermaster activities with the Court each year. Upon completion of the OBMP in 2000, specific tasks and activities were assigned to Watermaster's legal and engineering services in the implementation of the OBMP. The Peace I Agreement signed in 2000 outlined the parties intent to implement the OBMP as well as other responsibilities of the Watermaster and the parties to the Agreement. The Peace II Agreement signed in 2007, further detailed the OBMP measures for implementation. The OBMP consists of nine key elements covering a wide range of water activity in the basin, as listed and briefly described below (Watermaster, 2009).

Program Element 1 – Develop and Implement a Comprehensive Monitoring Program: Groundwater monitoring program consists of groundwater level monitoring, groundwater quality monitoring, production monitoring, surface water quality and quantity monitoring, land surface monitoring, and well construction, abandonment, and destruction monitoring. Watermaster has three active groundwater level monitoring programs operating in the Chino Basin: 1) A semiannual basin-wide well monitoring program, 2) A key well monitoring program associated with the Chino I and II Desalter well fields and the Hydraulic Control Monitoring Program, and 3) A piezometric monitoring program associated with land subsidence and ground fissuring in Management Zone 1 (MZ-1) (Watermaster, 2009).

Program Element 2 – Develop and Implement a Comprehensive Recharge Program: This element involves the planning, design, construction, and operation of groundwater recharge facilities, such as pipeline and channel turnouts, recharge basins, and SCADA monitoring systems. The facilities are intended to balance long-term groundwater production with recharge of storm, imported, and recycled water. Watermaster updates a monthly recharge spreadsheet which documents the amount of storm, imported, and recycled water recharged during the prior month and fiscal year to date (Watermaster, 2009).

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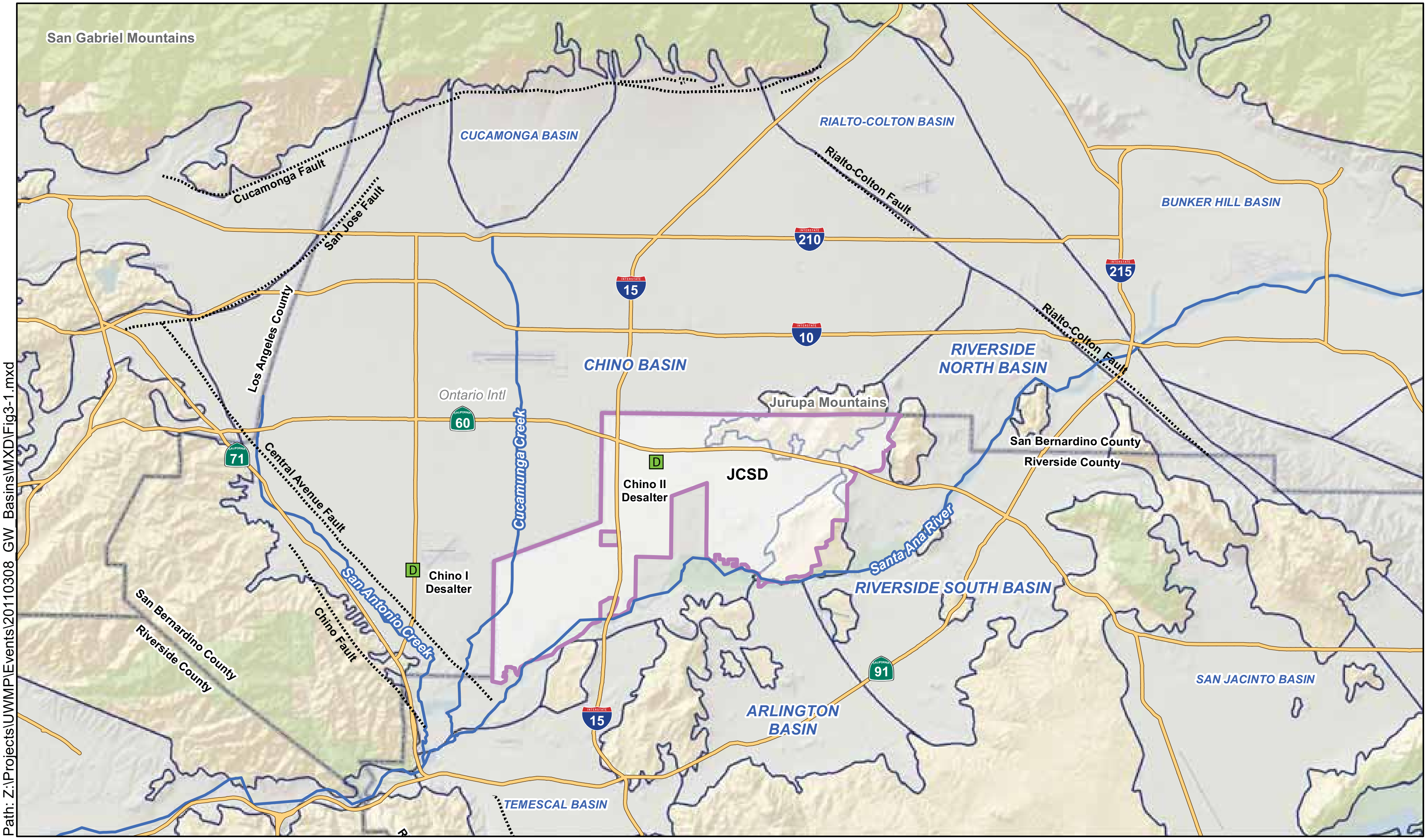

Image Source: ESRI

Legend

- D Desalter
- Surface Water (River, Creek)
- Fault Line
- Groundwater Basin
- JCSD Service Area

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Kennedy/Jenks Consultants

JCSD-2010 UWMP Update
Riverside County, California

Chino Basin

K/J 1088021*00
May 2011

Figure 3-1

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Program Element 3 – Develop and Implement Water Supply Plan for Impaired Areas of the Basin and Program Element 5 – Develop and Implement Regional Supplemental Water Program: These elements have been combined since the plan is to expand the capacities of the Chino I and Chino II Desalters and their associated well fields so as to increase potable supplies, maintain groundwater production in an area of rapid urbanization, and remediate legacy contaminant plumes. The desalter plant expansions will continue to remove salt from the basin, thus, enabling the recharge basins to accept recycled water (Watermaster, 2009).

Program Element 4 – Groundwater Management Plan for MZ-1: Because of the historical occurrence of pumping-induced land subsidence and ground fissuring in southwestern Chino Basin (southern MZ-1), the OBMP called for the development and implementation of an interim management plan for MZ-1 that would minimize subsidence and fissuring in the short-term, collect information necessary to understand the extent, rate, and mechanisms of subsidence and fissuring, and formulate a long-term management plan to reduce to tolerable levels or abate future subsidence and fissuring. The purpose of this element is to develop a long–term management plan to minimize subsidence and fissuring in MZ-1 (Watermaster, 2009).

Program Element 6 – Cooperative Program to Improve Basin Management and Program Element 7 – A Salt Management Program: Program Element 6 has evolved into a cooperative effort with the Regional Water Quality Board – Santa Ana Region (RWQCB – SAR) to investigate and/or remediate the legacy plumes found in the Chino Basin. The major plumes currently being investigated are the volatile organic compound (VOC) plume south of Ontario International Airport, the Kaiser Plume, the Stringfellow perchlorate plume, and the Chino Airport VOC plume. Program Element 7 consists of total dissolved solids and nitrogen monitoring of both groundwater and surface water pursuant to the 2004 Basin Plan Amendment. Quarterly reports summarizing data collected are submitted to the RWQCB - SAR (Watermaster, 2009).

Program Element 8 – Groundwater Storage Management Plan and Program Element 9 – A Storage and Recovery Program: In February 2008, the Dry-Year Yield (DYY) Expansion Project was initiated by Inland Empire Utilities Agency (IEUA) and the Watermaster to evaluate increasing the DYY storage account. The purpose of the DYY Expansion Project was to determine the facilities needed to store up to 150,000 AF and to recover up to 50,000 AFY. The expansion project analysis was completed in December 2008. The expansion project evaluated the technical, financial, and institutional frame work for individual projects to move forward (Watermaster, 2009). The DYY provided Metropolitan the right to store groundwater in the basin, as a hedge against drought, in exchange for paying the costs of developing the facilities that deliver that water. This program has now almost completed a full cycle, with Chino Basin benefiting from those facilities, and by Metropolitan having filled the account and now drawing it down over three years.

3.3.1.2 Groundwater Levels

Groundwater in the Chino Basin generally flows in a south-southwest direction from the primary areas of recharge in the northern parts of the basin toward the Prado Flood Control Basin in the south (Wildermuth Environmental Inc., 2007). Groundwater flow direction mimics surface drainage patterns from the forebay areas of high elevation (areas in the north and east flanking the San Gabriel and Jurupa Mountains) towards areas of discharge near the Santa Ana River within Prado Flood Control Basin. Trends seen in the groundwater contour maps for fall 2006 are generally consistent with past groundwater elevation contour maps. There are notable pumping depressions in the groundwater level surface that interrupt the general flow patterns in the northern portion of MZ-1 and directly southwest of the Jurupa Hills. The fall 2006 groundwater contour map also shows a discernible depression in groundwater levels surrounding the Chino I Desalter well field. Depth to groundwater increases to the north to provide a thick vadose zone for percolating groundwater in the forebay regions of Chino Basin.

As mentioned above, Watermaster has three active, comprehensive groundwater level monitoring programs to collect basin-wise groundwater level data (Watermaster, 2009). The groundwater level monitoring program is comprised of about 700 wells, with water level data collected quarterly with the assistance of several partner agencies. The wells in the monitoring program within the southern portion of the basin were mainly selected to assist in Watermaster's monitoring programs for desalter impacts to private well owners, Hydraulic Control, and land subsidence.

3.3.1.3 Available Groundwater Supplies

The projected groundwater pumping by JCSD in the Chino Basin and Riverside Basin is summarized in Table 3-3. JCSD produces water from groundwater sources from the Chino Basin, which was adjudicated by the Judgment in 1978 (Appendix C). The Judgment represents a plenary adjudication of all water rights in the Chino Basin and is administered under the authority of the Watermaster with continuing jurisdiction by the Court. The Judgment declares that the safe yield of the Chino Basin is 140,000 AFY, which is allocated among the three pools as follows:

- Overlying Agricultural Pool 82,800 AFY
- Overlying Non-Agricultural Pool 7,366 AFY
- Appropriative Pool 49,834 AFY

A fundamental premise of the Judgment is that all Chino Basin water users will be allowed to pump sufficient water from the basin to meet their requirements. To the extent that pumping exceeds the share of the safe yield, assessments are levied by the Watermaster to replace the overproduction. The Judgment recognizes that there exists a substantial amount of available groundwater storage capacity in the Chino Basin that can be utilized for storage and conjunctive use of supplemental water and basin waters; makes utilization of this storage subject to Watermaster control and regulation; and provides that any person or public entity, whether or not a party to the Judgment, may make reasonable beneficial use of the available storage, provided that no such use shall be made except pursuant to a written storage agreement with the Watermaster.

Land use conversion in the Chino Basin occurs when a member of the Chino Basin Agricultural Pool converts property to a non-agricultural use. Prior to the Chino Basin Peace I Agreement (Appendix D) signed in 2000, for every acre converted to non-agricultural use, the appropriator in which the agricultural property was located, received 1.3 AFY of water rights. The Peace I Agreement increases the amount the appropriator receives to 2 AFY of water rights for agricultural land conversion within its jurisdiction.

The Riverside Basin, in Riverside County discussed in Section 3.3.2 is a non-adjudicated groundwater basin that is in the process of developing groundwater management activities between the groundwater basin users.

Table 3-3
Projected Groundwater Production (AFY)

Water Supply Sources	2015	2020	2025	2030	2035
Supplier Produced Potable Groundwater from Chino Basin[a]	13,805	13,748	12,819	11,920	10,491
CDA Purchased - Existing	8,200	8,200	8,200	8,200	8,200
CDA Purchased - Future	3,300	3,300	3,300	3,300	3,300
Riverside Basin Groundwater Pumping- Existing (non-potable)[b]	600	600	600	600	600
Chino Basin Groundwater Pumping- Existing (non-potable) [b]	200	200	200	200	200
Chino Basin Groundwater Pumping- Future (non-potable)[b]	857	857	857	857	857
Total	**26,692**	**26,905**	**26,976**	**25,077**	**23,648**
Percent of Total Supply	93%	79%	75%	71%	66%
Total Potential Production Capacity [c]	54,000	54,000	54,000	54,000	54,000

a. JCSD production in accordance with assigned safe yield of 2,061 AFY as delineated in the Judgment with current and future Net Ag Pool Reallocation and SARWC Water lease.

b. Projected Non-Potable Sources

c. Potential Potable Groundwater Capacity for Maximum Day production

Table 3-4 presents a summary of current and future groundwater pumping rights and contract purchases by JCSD in the Chino Basin and Riverside Basin. As a party to the adjudication, JCSD's legal right to pump groundwater in the Chino Basin includes amounts in excess of its allocated safe yield (i.e. agricultural pool reallocation) as described under the Judgment and detailed as follows. Pumping in excess of safe yield can occur because of the OBMP activities that maintain groundwater recharge in the Chino Basin. Additional pumping in the Chino Basin in excess of the values shown in Table 3-4 can also occur, although this additional pumping will incur replenishment charges. Current Ag Pool Reallocation value reflect the scale of groundwater pumping that is allowed which is not strictly a pumping right but is consistent with the groundwater adjudication and OBMP activities.

JCSD has an assigned share of operating safe yield in the Chino Basin of 2,061.118 AFY, out of the total Chino Basin safe yield of 140,000 AF. This amount is shown as “Chino Basin” assigned safe yield in Table 3-4. As a result of the past and continuing agricultural landuse conversion, (i.e., net Agricultural Pool reallocation), water transaction activity such as leasing water rights from SARWC or other entities, and new yield, JCSD’s net annual production right in the 2008-2009 production year (fiscal year ending June 30) was 15,509.175 AF (Webb, 2010a). For production year 2009-2010 JCSD received a net Agricultural Pool reallocation of 12,622.316 AFY, as reported in the Watermaster’s Annual Report for fiscal year 2009-2010 (Watermaster, 2010). JCSD’s net Agricultural Pool reallocation for the 2010-2011 production year was reported to be 12,622 AF, which is shown in Table 3-4 as Current Pumping Right.

Within the Chino Basin, there is about 2,720 acres of lands left to be converted within JCSD’s service area. Once this land conversion occurs, JCSD will ultimately receive about 5,440 AF of additional production. This land use conversion will increase the JCSD’s estimated production without replenishment obligation to about 18,800 AFY over the next 20 years. In other words, the annual amount of water within JCSD that can be pumped without being subject to a replenishment assessment due to the combination of past and continuing agricultural land use conversions is conservatively expected to be 18,800 AF annually out of 27,934 AF of JCSD’s current well field production capacity. (Webb, 2010b). This 18,800 AFY Chino Basin production allocation can be exceeded but will be charged an additional replenishment fee to accommodate the additional production while maintaining the operating yield of the Chino Basin under the OBMP.

A market for the lease or sale of pumping right within the Chino Basin is an important part of the management of this groundwater supply. As shown in Tables 3-3 and 3-4, JCSD has 1,200 AFY of water lease from the SARWC.

Table 3-4
Groundwater Pumping Rights, AFY

Basin Name	Current Pumping Rights/Contract Amount	Future Pumping Rights/Contract Amount
Chino Basin [(a)]	2,061	2,061
Chino Basin Agricultural Pool Reallocation [(b)]	12,622	16,739
Chino Basin (water lease from SARWC) [(c)]	1,200	1,200
CDA Purchased (Desalination) – Existing[(d)]	8,200	11,500
Total	**24,083**	**31,500**

a. Assigned safe yield defines yearly volume of operating safe yield as delineated in the Judgment found in Appendix C.
b. Net Agricultural Pool Reallocation as reported in the 2010-2011 Watermaster is 12,622.316 AFY. This includes 1,232.952 AFY early transfer and the remaining amount accounts for land use conversions from agricultural to urban land uses. Future Pumping Rights are expected to total 16,739 AFY
c. Based on the Watermaster Pool 3 Production Detail for 2010-2011 under water transaction assigned rights Santa Ana River Water Company.
d. CDA deliveries includes the current contract amount. Future CDA delivery projection will also include additional 3,300 AFY beginning in 2015 with Chino II Desalter Expansion.

Table 3-5 presents JCSD's historical total groundwater pumping from 2005 to 2009, including pumping from the JCSD's existing wells, CDA purchased desalinated water, and pumping from the Riverside Basin. Pumping amounts are presented by production years (fiscal year ending June 30). On average, about 81 to 97 percent of water used in the service area was from groundwater extraction. The majority of pumping was in the Chino Basin, pursuant to the Judgment and through the CDA.

Table 3-5
Historical Groundwater Production (AFY) by Production Year

Basin Name	2005	2006	2007	2008	2009
Chino Basin (potable)[a]	16,476	18,241	17,439	18,114	13,805
CDA purchased (potable)[b]	3,476	8,351	8,797	8,623	8,675
Chino Basin (non-potable) [a]	211	207	250	259	212
Riverside Basin (non-potable) [a]	507	267	605	592	507
Total	**20,670**	**27,066**	**27,091**	**27,603**	**23,199**
% of Total Water Supply	81%	96%	97%	93%	89%

a. Based reported values (JCSD, 2010b)

b. Based on reported values (JCSD, 2010c)

JCSD's existing potable water supply comes from sixteen (16) wells, all located within JCSD's service area and drilled within the Chino Basin. JCSD's historical pumping for potable use from its existing wells ranged from 15,975 AF in 2009 to 19,747 AF in 2008, as shown in Table 3-5. Groundwater production in 2009 was less than during the previous four years which is indicative of the recent rate increases, drought conditions and poor economic conditions.

JCSD's existing potable supply well field has a current maximum production capacity of 25,975 gpm potable water, or 41,901 AFY, as of year 2010. However, JCSD does not operate its wells at maximum capacity (i.e., operating 24 hours per day for 365 days per year) and only uses its maximum capacity during maximum day and peak hour conditions and for redundancy. The existing well field annual production capacity is approximately at 27,934 AFY for year 2010, which is estimated as 2/3 of the maximum capacity of 41,901 AFY. Historical potable well pumping between 2005 and 2009 have been below JCSD's well field capacity of 27,934 AFY; thus, JCSD has not fully utilized its well field capacity. Future pumping projections by JCSD as shown in Table 3-3 will also be below the current well field production capacity of 27,934 AFY and potential future production capacity of 54,000 AFY.

JCSD also receives groundwater extracted from the Chino Basin and treated at the CDA's Chino I and II Desalters (Table 3-5). The quantity of water that JCSD purchased through CDA ranged from 3,476 AF to 8,797 AF between 2005 and 2009. As further explained below in Section 3.6, JCSD's current delivery from the CDA is 8,200 AFY and an additional delivery capacity of 3,300 AFY to JCSD is anticipated by 2015 from the proposed Chino II Desalter expansion.

In addition, JCSD currently uses non-potable irrigation wells to extract water from the Chino Basin. During 2005 to 2010, JCSD used up to six non-potable wells to produce groundwater ranging from 207 AFY to 259 AFY (JCSD, 2010c)

Non-potable groundwater pumping from the Riverside Basin comprised only a small portion of total groundwater pumping, ranging from 267 AFY to 605 AFY during 2005 and 2009 (JCSD, 2010c).

Adequacy of Supply

As mentioned above, water rights within the Chino Basin were adjudicated in 1978. Pumping within the Chino Basin is managed and reported by the Watermaster. The principal function of adjudication generally is to control the use of a water source in order to ensure the source is utilized in an optimum manner.

The Chino Basin stores approximately 5 million AF of groundwater with the capability of storing an additional 1 million AF. For purposes of adjudication, the central feature is the determination of the safe yield of the basin. The Judgment established the safe yield of the Chino Basin as 140,000 AFY. As mentioned above, pursuant to the Judgment, the average safe yield of the Chino Basin is allocated among the three "pools" of users. In the Chino Basin, groundwater is re-allocated to the Appropriative Pool for urban use from the Overlying Agricultural Pool when it is not pumped by the agricultural users.

The Watermaster may determine that the operating safe yield can be higher from year-to-year depending on factors including favorable precipitation and management efforts that maximize the beneficial use of the Chino Basin. Based on the historical records of pumping in the Chino Basin, as reported by the Watermaster, total pumping ranged approximately from 160,000 AF to 180,000 AF from 2000 to 2005 and started to decline in 2007. Pumping for the 2009-2010 production year was 114,496 AF.

The Judgment does not place specific limits upon the groundwater production by any party to the Judgment, including JCSD. Each of the parties to the Judgment, divided into three pools, are prohibited from pumping the basin in excess of their rights except pursuant to the provisions of the Physical Solution" (Judgment, Paragraph 13(a)-(c)). As described earlier, additional groundwater production in excess of the safe yield is allowed by the adjudication provided that the pumped water is replaced with replenishment water. Historically, the Watermaster has purchased imported water from Metropolitan to provide replenishment water when pumping exceeds the safe yield of the Chino Basin.

The Judgment (Paragraph 45) provides the Watermaster with the authority to levy and collect assessments for the purchase of water necessary to balance the production by any party in excess of that party's allocated share of safe yield of the Basin. The Judgment (Paragraphs 49 and 50) also describes the sources of water which are authorized to function as sources of replenishment water and the methods by which water can be replenished to the Chino Basin. Paragraph 7 of the Judgment describes the way in which cost for replenishment water will be spread among the members of the Appropriative Pool, which includes JCSD.

The aforementioned paragraphs of the Judgment show a clear expectation that the parties to the Judgment, including JCSD, would produce water in excess of their adjudicated production rights; provided, however, they must pay a replenishment assessment when production exceeds that amount. JCSD's ability to produce water from the Chino Basin is thus largely a matter of cost. Water produced in excess of a party's production rights will cost more than water produced within a party's production rights. Thus, the quantity and reliability of groundwater supplies is a matter of the cost of the water produced from the Chino Basin rather than limitations on JCSD's access to groundwater supply (Webb, 2010b).

Sustainability

With the adjudication of water rights, the Watermaster has held oversight responsibilities for the groundwater basin since its formation in 1978. Management of the Chino Basin is guided by the 2000 "Peace Agreement" (Peace I Agreement) for the Chino Basin OBMP (see Appendix D). The Watermaster manages pumping within the basin and files an annual report of Watermaster activities with the Court each year. Annual reports have been prepared since 1978 and each report is publicly available at the Watermaster website. With the development of the OBMP for the Chino Basin in 2000 by the Court, specific tasks and activities were assigned to Watermaster's legal and engineering services for the implementation of the OBMP. As described earlier, the OBMP consists of nine key elements with a detailed program consisting of hundreds of specific actions designed to resolve basin water supply and quality challenges, and to maintain sustainability of groundwater resources. The OBMP is being systematically implemented and continually refined. Watermaster has three active, comprehensive groundwater level monitoring programs that are integral part of the basin management. Groundwater level monitoring activities include a semiannual basin-wide well monitoring program, well monitoring program associated with the Chino I and II Desalter well fields and additional monitoring associated with land subsidence (Watermaster, 2009).

The most important initiative of the recent years has been the completion of the Recharge Master Plan Update. Work on the plan was initiated in 2008 and continued through 2009, and completed in 2010. Implementation of the Recharge Master Plan Update will begin during the 2010-2011 fiscal year. A key goal of the plan is to identify how the basin can take larger amounts of water during wet periods and recharge it in a shorter amount of time, considering potential cutbacks of replenishment water (e.g., SWP water) during drought periods.

3.3.2 Riverside Groundwater Basin Description

Local groundwater supplies from the Riverside Basin represent a small supplemental source of water for JCSD. The location of the Riverside Basin is shown on Figure 3-1. Riverside Basin is identified in the DWR Bulletin 118, 2003 Update as the Riverside portion of the Riverside-Arlington Subbasin (No. 8-2.03), as part of the Upper Santa Ana Valley Groundwater Basin (No. 8.2) (DWR, 2003). The Riverside-Arlington Basin is further divided locally into the Riverside North (the portion of the Riverside Basin within San Bernardino County), Riverside South (the portion of the Riverside Basin within Riverside County), and the Arlington Basin. The Riverside North and South basins are described further below. JCSD's non-potable wells are in the Riverside South basin.

The Riverside-Arlington Subbasin covers approximately 58,000 acres (92 square miles), underlying part of the Santa Ana River Valley in northwest Riverside County and southwest San Bernardino County. It is bound by impermeable rocks of Box Springs Mountains on the southeast, Arlington Mountain on the south, La Sierra Heights and Mount Rubidoux on the northwest, and the Jurupa Mountains on the north. The northeast boundary is formed by the Rialto-Colton fault, and a portion of the northern boundary is a groundwater divide beneath the City of Bloomington. The Santa Ana River flows over the northern portion of the subbasin.

Annual average precipitation is about 10 to 14 inches (DWR, 2003). The Rialto-Colton fault to the northeast acts as a groundwater flow barrier, separating the Riverside-Arlington Subbasin from Rialto-Colton Subbasin.

The groundwater basin is replenished by infiltration from Santa Ana River flow, underflow from the Rialto-Colton fault, intermittent underflow from the Chino Basin, return irrigation flow, and deep percolation of precipitation (DWR, 2003). Sources of major outflows in the basin include pumping, underflow to the Chino Basin, and discharge to the Santa Ana River. Groundwater pumping from the Riverside portion was approximately 39,000 AF, based on data from 1976 to 2000, as reported in the City of Riverside 2005 UWMP (City of Riverside, 2005).

Both Riverside North and Riverside South basins are located within the central portion of the Santa Ana River watershed, and both basins are not adjudicated (City of Riverside, 2005). Under the 1969 Judgment, San Bernardino Valley Municipal Water District (SBVMWD) is obligated to maintain water levels within the Riverside North Basin. SBVMWD annually reviews groundwater conditions to primarily access the existence of high groundwater conditions.

3.3.2.1 Draft Groundwater Management Plan

The California State Legislature passed Assembly Bill 3030 (AB 3030) during the 1992 legislative session allowing local agencies to develop Groundwater Management Plans (GWMPs). The legislation declares that groundwater is a valuable resource that should be carefully managed to ensure its safe production and quality. The legislation also encourages local agencies to work cooperatively to manage groundwater resources within their jurisdiction. Senate Bill 1938 (SB 1938) was passed by the Legislature September 16, 2002 and made changes and additions to sections of the Water Code created by AB 3030.

A small portion of JCSD overlies the Riverside Groundwater Basin. The City of Riverside Public Utilities (RPU) initiated a stakeholder-based groundwater management planning effort for the Riverside Groundwater Basin that has resulted in a draft Groundwater Management Plan as of November 2008.

3.3.2.2 Groundwater Levels

Groundwater in the Riverside-Arlington Subbasin moves northwest near Arlington, then flows southwest to Arlington Gap, through which it flows into the Temescal Subbasin. In the northeastern part of the subbasin, historical groundwater levels near the Santa Ana River fluctuated about 20 feet during 1985 through 2001 and declined about 10 feet during 1995 through 2000. In the central part of the subbasin near Riverside, groundwater levels were fairly steady during 1965 through 1985, fluctuating about 4 feet (DWR, 2003). From 1985 to 2004, water levels in the Riverside South groundwater basin decreased about 40 feet. This period include a period of drought (1987-1991) which is a potential reason for the decrease. More recent data from 2002 – 2004 indicate a slightly increasing trend in water levels (Metropolitan, 2007).

3.3.2.3 Available Groundwater Supplies

JCSD's non-potable pumping occurs in the Riverside South basin. Currently, JCSD uses two existing non-potable irrigation wells (Wells 5 and 21) in this basin to produce a small amount of groundwater for non-potable use. Historical pumping by JCSD from the Riverside Basin ranged from 267AF to 605 AF between 2005 and 2009 (Table 3-5). Future water supplies from the Riverside Basin are expected to be approximately 600 AFY, as shown in Table 3-3 to continue to use non-potable water for irrigation. (Webb, 2010a).

Current and future projected pumping by JCSD in the Riverside Basin and projected pumping by other major pumpers (i.e., City of Riverside) in this basin are expected to be within sustainable yields since efforts to manage groundwater in the basin have been initiated; thus, availability of this local groundwater source for JCSD is not considered an issue.

Adequacy of Supply

The Riverside South Basin is not adjudicated (City of Riverside, 2005) and the basin is not identified as overdrafted or projected to be overdrafted by the DWR (2003). Riverside South, where JCSD pumping occurs, covers about 20,000 acres with an estimated storage of 986,000 AF. Historical pumping in the Riverside Basin is well below the storage estimate. The majority of pumping occurs by the City of Riverside. Groundwater pumping between 2000 and 2005 within the City of Riverside service area ranged from approximately 10,000 AF to 21,000 AF from Riverside South, and from 4,800 AF to 6,000 AF in Riverside North (City of Riverside, 2005). Total projected pumping from Riverside South and Riverside North would range from 34,000 AF to 41,000 AF. This projected pumping is based on safe yield of the basins, and no adverse impacts on existing groundwater sources (i.e., levels) are expected (City of Riverside, 2005). Reductions in groundwater pumping by Riverside have occurred since 2008 in the Riverside Groundwater Basin according to anecdotal reports by the City of Riverside.

3.3.3 Potential Supply Inconsistency

Water supplied within the JCSD service area is almost entirely from groundwater. Chino Basin is the primary water source to meet both potable and non-potable demand. As a result of the Judgment and the resulting management activities including the OBMP, the Chino Basin is a highly reliable source of supply that is monitored regularly by the Watermaster. The Riverside Basin water supply for JCSD is a relatively minor portion of the overall JCSD demand with no anticipated supply inconsistencies because of the management of the basin. Therefore, JCSD does not have any inconsistent water sources that may cause reduced deliveries to users within the service area. A potential exception is areas where water quality could limit use as a potable supply. Groundwater quality in the lower Chino Basin is poor, as nitrate and TDS exceeding drinking water standards. Nitrate and TDS intrusion are primarily from historic dairy and agricultural users. Other water quality concerns include the presence of perchlorate, VOCs and other chemicals associated with airport cleanup sites (Ontario International and Chino Airports). Watermaster continues its active role in cleanup sites across the basin.

Water quality issues in the Chino Basin have been addressed by the completion of desalter facilities and the installation of well head ion exchange treatment facilities. Water quality produced from these facilities is within standards set for acceptable drinking water by the Federal Government and the California Department of Public Health (DPH).

3.4 Transfers, Exchanges, and Groundwater Banking Programs

Additional water supplies can be purchased from other water agencies and sources, and JCSD is currently exploring opportunities. An important element to enhancing the long-term reliability of the total mix of supplies currently available to meet the needs of the service area is the use of transfers, exchanges, and groundwater banking programs, and recycled water such as those described below.

3.4.1 Transfers and Exchanges

An opportunity available to JCSD to increase water supplies is to participate in voluntary water transfer programs. Since the drought of 1987-1992, the concept of water transfer has evolved into a viable supplemental source to improve supply reliability. The initial concept for water transfers was codified into law in 1986 when the California Legislature adopted the “Katz” Law (California Water Code, Sections 1810-1814) and the Costa-Isenberg Water Transfer Law of 1986 (California Water Code, Sections 470, 475, 480-483). These laws help define parameters for water transfers and set up a variety of approaches through which water or water rights can be transferred among individuals or agencies.

One of the most important aspects of any resource planning process is flexibility. A flexible strategy minimizes unnecessary or redundant investments (or stranded costs). The voluntary purchase of water between willing sellers and buyers can be an effective means of achieving flexibility. However, not all water transfers have the same effectiveness in meeting resource needs. Through the resource planning process and ultimate implementation, several different types of water transfers could be undertaken.

3.4.2 Opportunities for Short and Long-Term Transfers and Exchanges

Transfer opportunities currently available in the JCSD service area include the current and future projected transfers from the Rubidoux Community Services District (Rubidoux CSD) as well as a long-term lease of Chino Basin pumping right from the SARWC. JCSD has been purchasing water from Rubidoux CSD since 2000. Rubidoux CSD extracts water from the Riverside South basin. In 2009, JCSD purchased 480 AF from Rubidoux CSD. JCSD has opened negotiations with Rubidoux CSD to purchase additional water from them in the future. Total water transfer from Rubidoux CSD is projected to be 1,500 AFY, as shown in Table 3-1. Of this amount, 500 AFY is currently available and 1,000 AFY is anticipated to be available by 2015.

JCSD has a long-term lease from the SARWC of up to 1,200 AFY. The groundwater is pumped using JCSD facilities but is tracked in accordance with the Judgment and the lease agreement.

3.4.3 Groundwater Banking Programs

With recent developments in conjunctive use and groundwater banking, significant opportunities exist to improve water supply reliability in the Chino Basin. Conjunctive use is the coordinated operation of multiple water supplies to achieve improved supply reliability. Most conjunctive use concepts are based on storing groundwater supplies in times of surplus for use during dry periods and drought when surface water supplies would likely be reduced.

Groundwater banking programs involve storing available SWP surface water supplies during wet years in groundwater basins, as occurs locally through the OBMP. Groundwater banking to benefit JCSD could also occur outside of the Chino Basin as described further. Water would be stored either directly by surface spreading or injection, or indirectly by supplying surface water to farmers for their use in lieu of their intended groundwater pumping. During water shortages, the stored water could be pumped out and conveyed through the California Aqueduct to the banking partners, or used by the farmers in exchange for their surface water allocations.

Groundwater artificial recharge in the Chino Basin is an integral part of the Watermaster's basin management. As required by the Peace Agreement and summarized in the OBMP Recharge Master Plan, Watermaster initiated the Chino Basin Groundwater Recharge Program. This is a comprehensive program to enhance water supply reliability and improve the groundwater quality of local drinking water wells throughout the Chino Basin by increasing the recharge of stormwater, SWP imported water, and recycled water. There are 21 recharge facilities in Chino Basin to recharge the basin using stormwater, SWP water, and recycled water. The general recharge requirements are outlined by the Peace Agreement. Recycled water recharge is subject to the requirements set forth by the RWQCB - SAR in 2005. A new permit that greatly expands the recycled water recharge capacity of the Chino Basin was approved in June 2007 by the RWQCB - SAR to regulate the recharge of storm, imported and recycled waters.

Stormwater recharge is monitored by IEUA pursuant to the Chino Basin Recharge Facilities Operating Procedures (GRCC, 2006). Since 2000, total stormwater recharge has averaged approximately 3,700 AFY. During fiscal years of 2004-2005 and 2005-2006, total storm water recharge in Chino Basin was approximately 1,400 and 13,000 acre-ft, respectively.

SWP water for recharge in the Chino Basin is currently available to the region from Metropolitan. Metropolitan delivers SWP water into the Chino Basin from the Foothill Feeder, flowing from east to west across the northern half of the Chino Basin. Since 2000, the total supplemental water recharge – consisting of imported and recycled waters –has averaged approximately 12,800 AFY. During fiscal years 2004-2005 and 2005-2006, total SWP water recharge in the Chino Basin was approximately 12,300 and 34,600 acre-ft, respectively.

Total recycled water recharge in Chino Basin during fiscal years 2004-2005 and 2005-2006 was approximately 160 and 1,300 acre-ft, respectively. The aggregate average recycled water recharge that has occurred since the OBMP was implemented is about 440 acre-ft/yr.

3.5 Planned Water Supply Project and Programs

JCSD has planned for water supply projects in the fiscal year 2009-2010-budget as noted in Table 3-6 (Webb, 2010a). Not included is a connection to Western MWD facilities (the Riverside-Corona Feeder Project) that would provide an additional source of water for JCSD. Total budget (both approved and planned) from 2008-2009 through 2012-2013 is approximately $45.8 million. The future water projects include the CDA expansion, JCSD-Rubidoux CSD interconnection, and budgeted or planned water wells. Each of the future water projects is briefly described below.

Table 3-6
Planned Water Supply Projects and Programs by JCSD

Name/Type	Planned Delivery (AFY)	Date Supply Available
Chino II Desalter Phase III Expansion	3,300	2014
Rubidoux CSD Connection	1,000	2012
Water Wells - Budgeted	5,400	2014
Water Wells – Budgeted	5,400	2015

3.5.1 CDA Expansion

As a member of the CDA, JCSD is currently entitled to 2,700 AFY from the Chino I Desalter and 5,500 AFY from the Chino II Desalter. Thus, the total amount of water contracted to be purchased by JCSD from the Chino I and II Desalters is 8,200 AFY. Currently, JCSD, the City of Ontario, and Western MWD are working with the CDA to proceed with the next expansion of the Chino desalter facilities. The proposed CDA expansion will increase the capacity of the Chino II Desalter by 10,600 AFY of which JCSD will receive approximately 3,300 AFY. Water is projected to be available from this project expansion in 2014. The expansion will provide additional water supplies for these three agencies while at the same time meeting the objectives of the Chino Basin OBMP in connection with the Peace I and Peace II Agreements (Appendix D).

3.5.2 JCSD-Rubidoux CSD Interconnection

JCSD has been purchasing water from Rubidoux CSD since 2000 and is in the process of planning a second interconnection to Rubidoux CSD, which is currently budgeted. Rubidoux CSD extracts water from the Riverside South basin. In addition to 500 AFY, that is currently available from Rubidoux CSD, JCSD has opened negotiations with Rubidoux CSD to purchase additional 1,000 AFY of water in the future. This supply is anticipated to be available by 2015.

3.5.3 Water Wells

JCSD is in the process of developing four new groundwater wells which will provide approximately 9 to 11 MGD of supply. Collectively, these new facilities represent a significant increase in JCSD's water supply capabilities. These wells will provide increased supply capacity, reliability of production and accommodate anticipated growth. As a result of further analysis and Bond issuance work, the development of the wells will be split into two different phases, consisting of two wells each.

In addition to the planned water supply projects listed in Table 3-6, feasibility and planning study was recently completed to evaluate the potential existing raw water sources and transmission facilities to JCSD's Roger D. Teagarden Ion Exchange Plant (Webb, 2008). As currently configured and operating, the Teagarden Ion Exchange Plant has a treatment capacity of 10 MGD and a blending capacity of 14 MGD to deliver groundwater with treated water. Currently, the treatment plant has excess blending capacity and the plant capacity can be increased by process improvements and expanding the facility.

The Roger D. Teagarden Ion Exchange Plant could produce an additional 4 MGD or 2,800 gpm if the raw water supply is available. Six alternatives evaluated by Webb Associates as potential raw water sources that included existing water sources (wells) with elevated levels of nitrate. JCSD has three inactive wells (Sky Country Wells) and one under-utilized well (High School Well). SARWC has two inactive wells (Well Nos. 3 and 3A). JCSD's inactive wells have a capacity more than the excess blending capacity of the treatment plant. Four of these sources appear to be viable pending further investigation of these under-utilized water sources. This potential supply of groundwater with elevated nitrate will need to be treated prior to use by the public. Funding to connect the High School Well water as a raw water source into the Roger D. Teagarden Ion Exchange Plant is phased beyond 2014, as the feasibility of this source needs to be further evaluated.

3.5.4 Other Opportunities

Development of additional water supply projects and programs by JCSD, beyond those noted in Table 3-6, will lead to a large financial commitment by JCSD. Therefore, timing and implementation of any future water development projects is dependent upon the reliability of the existing groundwater supply, growth in water demand, and the feasibility and cost of obtaining additional water supplies.

Additional water supply projects may include the following to add further reliability to JCSD's existing water supply portfolio and add robustness to its system.

- SWP water purchased from Metropolitan via the Etiwanda or Rialto Feeder. This project would require the construction of a water treatment plant and conveyamce facilities.

- Water from the Santa Ana Watershed Project Authority's existing Arlington Desalter. JCSD has indicated an interest in acquiring available production from the Arlington Desalter and from a proposed Expanded Arlington Desalter. Currently, there are 1,800 AFY of available product water for sale. Western MWD has funded a reconnaissance level investigation of the feasibility of expanding the Arlington Project from 7.4 MGD to 10.7 MGD.

- Construction of a water treatment plant via Metropolitan's Upper Feeder. Since the Upper Feeder conveys Colorado River water, the treatment plant would require the construction of a reverse osmosis plant in addition to a conventional treatment facility. JCSD may be able to treat the water conventionally and then blend with CDA water to lower the TDS limit of the water supply in order to meet the RWQCB – SAR wastewater discharge limits at the City of Riverside Regional Water Quality Control Plant.

- Connection to Western MWD's proposed Riverside Corona Feeder and the range of water supplies that may be available from Western MWD.

3.6 Development of Desalination

The California UWMP Act requires a discussion of potential opportunities for use of desalinated water (Water Code Section 10631[i]). JCSD has explored such opportunities, and they are described in the following section, including opportunities for desalination of groundwater.

3.6.1 Opportunities for Groundwater Desalination

JCSD's participation in the CDA and development of Chino I and II Desalters are the main desalinated water opportunities by the JCSD. The CDA, formed in 2002, is charged with design, construction, operation, and delivery of treated water from the existing Chino I and Chino II Desalters. The CDA, a Joint Powers Authority, is comprised of member agencies that include JCSD, IEUA, SARWC, and the Cities of Chino, Chino Hills, Ontario, and Norco. The CDA manages the production, treatment, and distribution of water produced by the desalter facilities.

The CDA is a critical program element to increase the Chino Basin groundwater production as it reduces salt balance within the basin and prevents poor quality of water from moving downstream in the watershed. The desalter process utilizes groundwater from water quality-impaired portions of the Chino Basin, as the treatment process reduces the excess salt and nitrates so the treated water may be used for potable purposes.

As a member of the CDA, JCSD is currently entitled to 2,700 AFY from the Chino I Desalter and 5,500 AFY from the Chino II Desalter. Thus, the total amount of water contracted to be purchased by JCSD from the Chino I and II Desalters is 8,200 AFY (Appendix E). In 1998, JCSD purchased 3,200 AFY of desalinated water capacity from Chino I Desalter. In 2000, during the Peace Agreement negotiations, JCSD agreed to purchase an additional 5,000 AFY of the 10,000 AFY of desalter water from the Chino II Desalter. With the CDA purchase agreements in 1998 and 2000, JCSD's current CDA purchased water reached the current total amount of 8,200 AFY. JCSD purchased 3,476 AF of water from CDA in 2005 and the amount increased to 8,351 AF in 2006. Between 2007 and 2009, water purchased from CDA ranged from 8,623 to 8,797 AF (Table 3-5). CDA water in excess of JCSD's existing right of 8,200 AFY is not guaranteed unless the Chino II Desalter is expanded, as planned. However, the Chino II Desalter is capable of producing in excess of design capacity (Webb, 2010).

Currently, JCSD, the City of Ontario, and Western MWD are working with the CDA to proceed with the next expansion of the Chino desalter facilities. As mentioned earlier, the expansion will provide additional water supplies for these three agencies while at the same time meeting the objectives of the Chino Basin OBMP in connection with the Peace I and Peace II Agreements (Appendix D). The proposed CDA expansion will increase the capacity of the Chino II Desalter by 10,600 AFY of which JCSD will receive approximately 3,300 AFY. Water is projected to be available from this project expansion in 2014.

3.6.2 Chino I Desalter

The Chino I Desalter was constructed in 2000 through a Joint Participation Agreement (Appendix E) among five agencies: the Santa Ana Watershed Project Authority, Western MWD, Orange County Water District, Metropolitan and IEUA. Chino I Desalter, located within the City of Chino, began product delivery in July 2000. An increased demand in contracted water deliveries to JCSD, the Cities of Chino Hills, the Chino, Norco, and Ontario necessitated the expansion of the Chino I Desalter. In order to increase the capacity of the Chino I Desalter, an ion exchange treatment system was determined to be the best alternative to achieve the water quality objective for the treatment plant. The addition of the Ion Exchange Treatment system increased Chino I Desalter's product water flow from 8.4 MGD to 14.2 MGD. The expansion project was completed in August 2005 and provides supplemental supply to the Cities of Chino, Chino Hills, and Ontario located within the IEUA's service area as well as JCSD, City of Norco and SARWC. As currently configured, the Chino I Desalter provides 2.6 MGD of treated (air stripping for VOC removal) water, 4.9 MGD of treated (ion exchange for nitrate removal) water, and 6.7 MGD of treated (RO for nitrate and TDS removal) water for a total of 14.2 MGD, or 15,900 AFY.

3.6.3 Chino II Desalter

The Chino II Desalter was initiated by the CDA to provide 10,400 AFY of water deliveries to JCSD, the City of Ontario, the City of Norco and the SARWC. Construction of the Chino I Desalter Expansion and the Chino II Desalter facilities was completed in February 2006. As mentioned above, efforts are underway to expand the Chino II Desalter, that will provide supplemental water supply to the three member agencies of the CDA, including JCSD, the City of Ontario, and Western MWD. The Chino II Desalter provides 4.0 MGD of ion exchange treated water and 6.0 MGD of reverse osmosis treated water from eight additional wells for a total of 10.0 MGD (or 11,200 AFY).

3.6.4 Opportunities for Seawater Desalination

Because the JCSD service area is not in a coastal area, it is neither practical nor economically feasible for JCSD to implement a seawater desalination program and JCSD has no current plans to pursue seawater desalination. Therefore, seawater desalinated supplies are not included in the supply summaries in this Plan. However, similar to the groundwater desalination opportunities described above, JCSD could provide financial assistance to Metropolitan or SWP contractors in the construction of their seawater desalination facilities in exchange for SWP supplies once conveyance facilities are available.

3.7 Recycled Water

This section provides an overview of the existing and future recycled water opportunities available to the JCSD service area as part of the supplies summaries in this Plan. The description includes potential opportunities identified for future use of recycled water. A detailed description of the future projected recycled water, and activities and studies undertaken by JCSD on development of recycled water are further described in Section 4.

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Section 4: Recycled Water

4.1 Overview

This section of the Plan describes the existing and future recycled water opportunities available to the JCSD service area. The description includes estimates of potential supply and demand for 2010 to 2035 in five year increments, as well as JCSD's proposed incentives and optimization plan.

4.2 Recycled Water Master Plan

As discussed in Section 3, the majority of water demand in the JCSD service area is met by water supplies from groundwater pumping in the Chino Basin. Up to 4,300 AFY of existing and future irrigation demand in the JCSD service area could be supplied by non-potable water (Webb, 2008) and no recycled water is currently used to meet non-potable demand. The 4,300 AFY is limited to public facilities including parks, medians, schools, and golf courses and does not include irrigation on private residential and commercial properties. At present, non-potable water of about 700 AFY is used for irrigation. As discussed in Section 2, the future water demand in the JCSD service area will increase as development continues; thus, JCSD recognizes that recycled water as a source of non-potable water could be an important and reliable source of additional water.

The use of recycled water has been gaining wide support in the JCSD area, where there are irrigation, commercial, landscapes, and industrial customers that could convert some or most of their water use to recycled water. Given the growing interest to use recycled water and increasing future water demand, JCSD has been exploring potential non-potable water sources not only to supplement the water supply portfolio but also to convert some of the existing irrigation pumping that is currently met by potable supplies. In 2008 and 2010, JCSD completed detailed evaluations of existing and future non-potable water demands throughout the service area and evaluated potential alternatives with non-potable water sources (in the context of the JCSD's non-potable water master plans, non-potable includes recycled water, i.e., treated wastewater, and non-potable groundwater). These non-potable water evaluations were reported in two planning studies listed below and key findings are summarized in this section of the Plan as they are relevant to the future development of recycled water use (Webb, 2008, 2010).

- Draft 2008 Non-Potable Water Master Plan (Webb, 2008) found in Appendix G
- 2010 Non-Potable Water Evaluation in the Eastern Portion of JCSD Service Area (Webb, 2010) found in Appendix G

During the development of these non-potable water master plans, JCSD identified three sources of recycled water that could potentially be used to provide recycled water to meet irrigation demands in the JCSD service area (Table 4-1). JCSD realizes that by utilizing recycled water from potential sources for irrigation and other non-potable purposes, JCSD can more efficiently allocate its potable water supply and increase the overall reliability of water supplies in the service area.

Table 4-1
Participating Agencies

Participating Agencies	Role in Plan Development
JCSD	Retail water provider
City of Riverside Regional Water Quality Control Plant (RWQCP)	Potential recycled water supplier
Western Riverside County Regional Wastewater Authority's Wastewater Treatment Plant (WRCRWA)	Potential recycled water supplier
Inland Empire Utility Agency (IEUA)	Potential recycled water supplier

Completion of the 2008 and 2010 non-potable water evaluations by JCSD is an important step toward future development of recycled water in the JCSD service area. These evaluations estimated existing and future non-potable water demands, identified viable non-potable and recycled water sources to meet a portion of the estimated demands, and made recommendations of most feasible alternatives for future consideration. The cost analysis of alternatives, however, suggested that it would be more economical for JCSD to remain on groundwater sources as long as these sources are available. At this time, implementation of proposed recycled water projects is pending funding availability. However, potential alternatives developed as part of the non-potable water evaluations and key findings are relevant to the future projections of recycled water use. For the purpose of water supply projections in this Plan, some level of conversion from potable groundwater to recycled water and/or non-potable well water use is projected to occur, based on the recommended alternatives in the 2008 and 2010 non-potable water evaluations.

A more detailed description of the 2008 and 2010 non-potable water evaluations, including the existing and potential non-potable water demands (both recycled water and non-potable well water) and alternatives evaluated are described below in Section 4.4 (Webb, 2008, 2010).

4.3 Potential Sources of Recycled Wastewater

JCSD is responsible for the collection and safe disposal of wastewater generated within the JCSD service area. Wastewater generated in the JCSD service area is treated at two regional wastewater treatment plants, the City of Riverside RWQCP and the WRCWRA Wastewater Treatment Plant[1]. Treated wastewater from these two plants is mainly discharged to the Santa Ana River. In addition, as discussed in the 2008 Non-Potable Water Master Plan, IEUA delivers recycled water near the Eastvale area of JCSD and could be considered as a third source of recycled water while reconstruction of JCSD's Indian Hills Wastewater Treatment Plant, which is currently not in operation, provides a fourth source of recycled water both of which are described in Section 4.3.3.

[1] Wastewater generated within CFD No. 1 is disposed of into the IEBL. The effluent in the IEBL is treated by Orange County Sanitation District.

4.3.1 Existing and Planned Wastewater Treatment Facilities

4.3.1.1 Existing Facilities

Wastewater generated in the JCSD service area is collected through pipelines and discharges into the City of Riverside RWQCP and WRCRWA. JCSD has over 319 miles of collection pipelines and the majority of flow is collected and transmitted by gravity flow. For situations where gravity flow was unattainable, pressure systems were utilized with lift stations and pumps (Webb, 2004).

Both the City of Riverside RWQCP and WRCRWA have tertiary treatment facilities and treated tertiary effluent from the plants is mostly discharged to the Santa Ana River. JCSD's current average wastewater flow discharge is approximately 3.28 MGD to the City of Riverside RWCQP and 2.1 MGD to the WRCRWA, based on monthly average of recorded (metered) data available from JCSD during 2006 and 2007 (Webb, 2007). Wastewater flows at ultimate "build-out" conditions are projected to be higher, as reported in the JCSD's 2004 Master Sewer Plan found in Appendix F (Webb, 2004). JCSD recently completed addenda to the original 2004 Master Sewer Plan and updated projected wastewater flows at ultimate "build-out". Wastewater flow discharge at "build-out" is projected to be 4.9 MGD to the Riverside RWCQP and 5.7 MGD to the WRCRWA, based on the most recent projections in the 2007 Master Sewer Plan Addendum (Webb, 2007). JCSD has two proposed projects to increase JCSD's wastewater flow capacity at the City of Riverside RWQCP and WRCRWA, as part of the JCSD's 20-year Capital Improvement Program. In addition to the efforts to increase the plant capacity, JCSD has been exploring the feasibility of utilizing treated wastewater from these plants for non-potable purposes.

4.3.1.2 Western Riverside County Regional Wastewater Authority's Wastewater Treatment Plant

WRCWRA's Wastewater Treatment Plant was brought online in 1998 and was designed to treat 8 MGD wastewater (Webb, 2008). The plant, located in the southeastern portion of JCSD, is operated by Western MWD (Figure 4-1). The plant consists of primary, secondary, and tertiary treatment. Wastewater from Western MWD's retail and wholesale customers, JCSD, the City of Norco, and Home Gardens Sanitary District is collected through many miles of pipelines, pumped to the treatment plant for treatment (WRCRWA, 2011). Tertiary treated effluent is discharged into the Santa Ana River, pursuant to the RWQCB – SAR Order No. R8-2008-005 and National Pollutant Discharge Elimination System (NPDES) permit No. CA8000316. The current regulations allow up to 8 MGD of tertiary treated wastewater discharge from the plant to the Santa Ana River. Discharged water from the plant to the Santa Ana River has potential benefits of water supply, as described by the Santa Ana Region (Basin Plan) that designates beneficial uses and establishes water quality objectives for all water in the Santa Ana Region.

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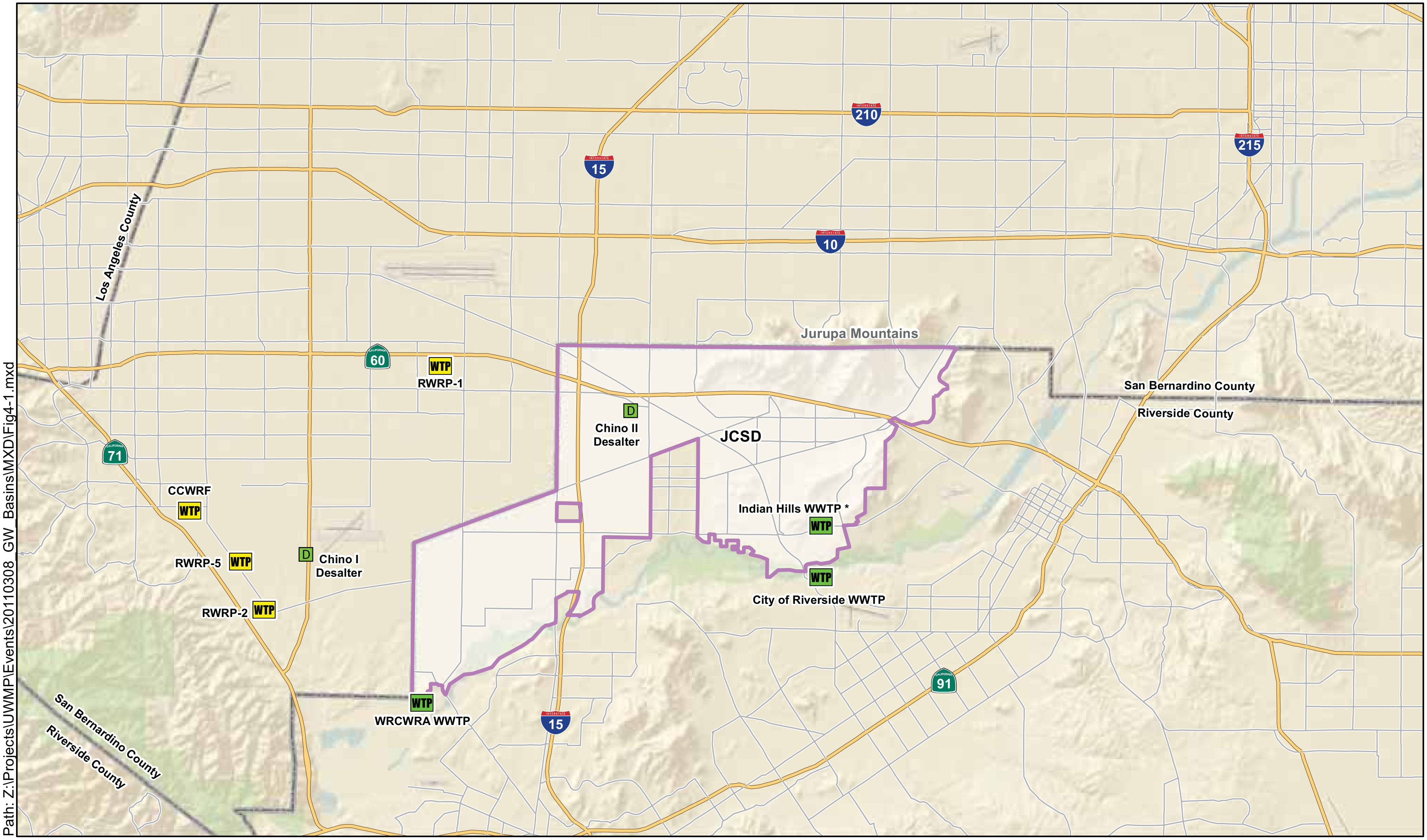

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Legend

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- WTP Wastewater Treatment Plant
- WTP IEUA Wastewater Treatment Plant
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Kennedy/Jenks Consultants

JCSD-2010 UWMP Update
Riverside County, California

Locations of Wastewater Treatment Facilities

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Figure 4-1

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As of November 2007, the plant was treating approximately 5.5 MGD. According to information published by WRCRWA, the plant is upgradable to treat 32 MGD (WRCRWA, 2011). Based on the most recent wastewater flow (metered) data reported in the JCSD's 2007 Master Sewer Plan Addendum, JCSD's wastewater flow contribution to this plant ranged from 1.92 MGD (April 2007) to 3.56 MGD (August 2007) with an annual average of 2.10 MGD, based on monthly averages from April 2007 to September 2007 (Webb, 2007). For the purposes of planning analysis in this Plan, the average wastewater flow of 2.1 MGD is considered to be representative of average existing wastewater flow contribution of JCSD to this plant. JCSD's 2007 Master Sewer Plan Addendum indicates that all of the wastewater generated within the Eastvale area (southwest portion of JCSD), including the Sky County development and Jurupa Valley High School, will discharge into the WRCRWA for treatment via the Eastvale Interceptor.

Ultimately the estimated flow rate from the JCSD to the plant is projected to be 5.7 MGD, based on the projections in the 2007 Master Sewer Plan Addendum (Webb, 2007). JCSD has a proposed project in its 20-year Capital Improvement Program to obtain additional treatment capacity at the WRCRWA. JCSD has the right to receive recycled water equal to the quantity of wastewater delivered to the plant (Webb, 2008). Although the plant does not currently provide any water for recycling purposes (Webb, 2008), the plant provides tertiary treatment, as mentioned above, and can meet all Title 22 requirements for producing recycled water. JCSD has been exploring the feasibility of utilizing reclaimed water from this facility for irrigation purposes. Potential alternatives were developed as part of the JCSD's non-potable water evaluations, as described further below under the recycled water demand.

4.3.1.3 City of Riverside Regional Water Quality Control Plant

The City of Riverside owns and operates the City of Riverside RWQCP. This plant is located in the City of Riverside on the south side of the Santa Ana River, just outside of the JCSD boundary (Figure 4-1). The City of Riverside RWQCP is responsible for collection and treatment of wastewater flows generated within the City of Riverside and the communities of JCSD, Rubidoux CSD, Edgemont CSD, and Highgrove CSD. The City of Riverside's collection system consists of approximately 800 miles of gravity sewers ranging from 6 to 48 inches in diameter and 18 wastewater pump stations. The wastewater pump stations range in size from 100 gpm up to 2,000 gpm.

The City of Riverside RWQCP is permitted by the RWQCB – SAR to treat 40 MGD (or 44,800 AFY) of wastewater. The facility currently produces about 36,000 AFY of treated effluent and discharges almost entirely to the San Ana River via a constructed channel that intersects the flow of the Santa Ana River. The City of Riverside discharges tertiary treated effluent to the Santa Ana River, pursuant to the RWQCB – SAR Order No. R8-2006-009 and NPDES Permit No. CA0105350. A portion of the effluent from this plant is directed through constructed wetlands (known as the Hidden Valley Wetlands Enhancement Project) before reentering a constructed channel. The City of Riverside RWQCP is capable of producing recycled water for irrigation purposes. A portion of the treated effluent is currently used for irrigation of approximately 41 acres at the Van Buren Golf Center, about 10 acres at the Van Buren median and frontage, and for industrial use at the Toro Manufacturing Company.

The City of Riverside recently prepared a Wastewater Collection and Treatment Facilities Integrated Master Plan to serve as a planning document for the City of Riverside RWQCP facility planning and collection system (Carollo Engineers, 2008). The recommended plan is intended to enable the City of Riverside RWQCP to continue to reliably provide wastewater treatment to the City of Riverside and other communities discharging wastewater to the plant. As the wastewater flow increases due to the projected population growth, this plan addresses facility needs for projected wastewater flow through the year 2025. Total average daily flows at the plant are projected to increase from 33.5 MGD (as of 2006) to 49.4 MGD by 2025 (Carollo Engineers, 2008). This projection accounts for the maximum expected wastewater flows from communities discharging wastewater to the plant. For JCSD, wastewater flow is projected to increase from 3.5 MGD (as of 2006) to 6.9 MGD by 2025, compared to JCSD's current purchased capacity 4.0 MGD at the City of Riverside RWCQP.

Based on historical data between 2000 and 2006, JCSD's wastewater flow discharge to the plant ranged from 3.2 MGD (in 2002) to 3.7 MGD in 2005 and was reported to be 3.5 MGD in 2006 (Carollo Engineers, 2008). The most recent wastewater flow (metered) data from JCSD, as reported in the 2007 Master Sewer Plan Addendum, indicate that monthly averages from January 2006 to June 2007 ranged from 2.21 MGD (April 2007) to 3.56 MGD (May 2006) with an annual average of 3.28 MGD (Webb, 2007). The annual average of 3.28 MGD falls within the historical ranges previously reported (Carollo Engineers, 2008). In the 2007 Plan, the average measured wastewater flow of 3.28 MGD is considered to be representative of average existing wastewater flow contribution of JCSD to the City of Riverside RWCQP.

Ultimately the estimated flow rate from the JCSD to the plant is projected to be 4.9 MGD, based on the projections in the 2007 Master Sewer Plan Addendum (Webb, 2007). Wastewater generated within the Jurupa area (the central and easterly portions of JCSD), Indian Hills area, and south of the Indian Hills WWTP (referred to as lower portion of tributary area J18) will all contribute to the City of Riverside RWQCP. JCSD has a proposed project in its 20-year Capital Improvement Program to obtain additional treatment capacity at the City of Riverside RWCQP.

In addition, JCSD has been exploring the feasibility of utilizing reclaimed water from this facility for irrigation purposes. A potential option was developed as part of the JCSD's 2010 non-potable water evaluations, as described further below. For planning purposes in this Plan, about 475 AFY of recycled water is projected to be available from the City of Riverside RWCQP by 2020 to irrigate the Indian Hills Golf Course or other facilities. This projection is consistent with potential recycled water options developed in the JCSD's 2010 non-potable water master plan studies and discussions with JCSD staff. Future use of recycled water at the golf course is a reasonable assumption, but implementation of this project is pending funding assistance.

4.3.2 Planned Improvements and Expansions

JCSD prepared the 2004 Master Sewer Plan to evaluate projected ultimate wastewater treatment capacity in the JCSD service area. This plan provided projected "build-out" average daily flows based on JCSD's standard waste generation factors and identified wastewater improvement and expansion projects over the next 20 years (Webb, 2004). An addendum to the original 2004 Master Sewer Plan was prepared in 2007 to reevaluate the wastewater generation factors based on current flow records and to recalculate the wastewater generation factors and ultimate "build-out" average daily flows based on the recorded data (Webb, 2007). The 2007 Master Sewer Plan Addendum also included updated cost and implementation schedule for proposed improvement and expansion projects to the sanitary sewer collection system. More recently in 2009, the Master Sewer Plan Addendum No. 2 was completed with the updated preliminary sewer project schedule and updated estimated project costs (Webb, 2009). Table 4-2 presents the list of improvement and expansion projects, their implementation schedule, and estimated project cost, based on the JCSD's Master Sewer Plan studies completed in recent years (Webb, 2004, 2007, and 2009). JCSD is currently reviewing sewer lines which have operational problems. Upon completion of the review and evaluation of these lines, a specific project list will be completed which will serve as the basis for a pipeline rehabilitation program. Therefore, cost for pipeline rehabilitation/replacement projects is yet to be determined.

Table 4-2
Proposed Improvement and Expansion Projects

Improvement Projects	Project Description	Implementation Schedule (Fiscal Year)	Estimated Project Cost (in millions)
Proposed Gravity Flow Pipelines and Projects	Improvements to the existing gravity flow sewer systems to provide adequate flow conveyance, including pipe replacement and rerouting.	2014-2015 through 2028-2029	$26.66
Pipeline Rehabilitation/ Replacement Projects	Rehabilitation/replacement of several sewer pipelines. Approximate lengths and sizes of pipelines are currently identified and will be used to estimate project cost.	2009-2010, and 2014-2015 through 2028-2029	To be Determined
Lift Station Rehabilitation/ Replacement Projects	Replacement of two lift stations, Sunnyslope and Florine, located in the northeastern corner of the JCSD. These two older lift stations will be abandoned and a new lift station will be constructed to pump the combined flows of the existing two Sunnyslope and Florine lift stations.	2009-2010 and 2010-2011	$2.13
Regional Wastewater Pump Station Expansion	Additional 7.0 MGD of pumping capacity is required. Regional Wastewater Pump Station currently has a capacity of 5.0 MGD. Ultimate peak design flows that could occur at the City of Riverside RWCQP are projected to be 12 MGD.	2010-2011 through 2013-2014	$6.9
New Regional Force Main to the City of Riverside RWCQP	A total of 16,000 linear feet with 24-inch diameter Regional Force Main assumed to run parallel to the existing Regional Force Main. These are pressure systems that pump wastewater flow from multiple tributary areas to regional wastewater treatment facilities.	2010-2011 through 2013-2014	$4.7

Improvement Projects	Project Description	Implementation Schedule (Fiscal Year)	Estimated Project Cost (in millions)
City of Riverside RWCQP Capacity Purchase	Obtaining additional treatment capacity - Additional purchase capacity of 0.9 MGD, given that JCSD's current treatment capacity of 4 MGD and the projected ultimate average daily flow capacity of 4.9 MGD.	2016 -2017 and 2020-2021	$9 - $14.4
WRCRWA Capacity Purchase	Obtaining additional treatment capacity - Additional purchase capacity of 2.45 MGD, given that JCSD's current treatment plant capacity of 3.25 MGD and the projected ultimate average daily flow capacity of 5.7 MGD.	2014-2015 through 2016-2017 and 2016-2025 through 2028-2029	$24.5 - $39.2
		Total Estimated Project Cost	**$73.88 - $93.88**

Source: Master Sewer Plan, prepared by Webb Associates (September 2004), prepared for JCSD; and Master Sewer Plan Addendum, prepared by Webb Associates (October 2007) for JCSD.

For the purpose of projecting wastewater flow discharge capacity in this Plan, most recent data and analysis provided in the JCSD's Master Sewer Plan, particularly the 2007 Addendum, were used as the basis for representing the average existing wastewater flow conditions (2010) and projecting future wastewater flow conditions by the year 2035. As mentioned above, the average wastewater flow of 3.28 MGD (or 3,674 AFY) is used to represent JCSD's existing contribution to the City of Riverside RWCQP, based on the metered wastewater flow data available between 2006 and 2007 (Webb, 2007). For the WRCRWA, the average wastewater flow of 2.1 MGD (or 2,352 AFY) is used to represent JCSD's existing contribution to the WRCRWA, based on the metered wastewater flow data in 2007 (Webb, 2007).

For future projections of wastewater flow discharge of JCSD to the City of Riverside RWCQP and WRCRWA, ultimate "build-out" average daily wastewater flows, as reported in the JCSD's 2007 Master Sewer Plan Addendum, were used as the basis for future projections. For consistency with the demand projections presented in Section 2 and the planning period in this Plan, ultimate "build-out" average daily flows are considered to be representative of future projected conditions by the year 2035. It was assumed that wastewater capacity would increase proportional to the water demand increase from the existing conditions in 2010 through 2035. Increase in wastewater capacity for intermediate years was calculated proportional to the rate of water demand increase over the same period. Table 4-3 provides the JCSD's existing and future projected wastewater flow contribution to the City of Riverside RWCQP and WRCRWA. The existing and planned methods of wastewater effluent discharge and use are summarized in Table 4-4. It should be noted that "build-out" flows in Table 4-3 reflect average daily dry weather flows, and wet weather and peak flows will be higher than those in the table. Using the JCSD's standard peaking factors and accounting for infiltration, JCSD's potential peak flows are estimated to be approximately 12 MGD for the City of Riverside RWCQP and 12.3 MGD for the WRCRWA (Webb, 2007).

Table 4-3
Wastewater Collection and Treatment (AFY)

Facility Name	Estimated Existing (2010)	2015[c]	2020[c]	2025[c]	2030[c]	2035[d]
City of Riverside RWCQP	3,674[a]	4,862	5,987	6,118	6,254	6,384
WRCRWA	2,352[b]	3,727	5,029	5,180	5,338	5,488
Total	**6,026**	**8,590**	**11,016**	**11,297**	**11,592**	**11,872**

a. Source: Annual average based on metered data from January 2006 to June 2007, reported as 3.28 MGD (approximately 3,674 AFY) in Appendix C of the 2007 Addendum Master Sewer Plan, prepared by Webb Associates (September 2007) for JCSD.
b. Source: Annual average based on metered data from April 2007 to September 2007, reported as 2.1 MGD (approximately 2,352 AFY) in Appendix C of the 2007 Addendum Master Sewer Plan, prepared by Webb Associates (September 2007) for JCSD.
c. Flows for intermediate years were calculated proportional to the increase in the water demand projections from 2010, representing the existing conditions, to 2035, consistent with the rate of demand increase presented in Section 2 of this Plan.
d. Source: Table 4 in the 2007 Master Sewer Plan Addendum, prepared by Webb Associates (October 2007) for JCSD.

Table 4-4
Non-Recycled Disposal of Wastewater

Facility Name	Method of Disposal	Treatment Level	Wastewater Discharge and Use (AFY)					
			2010	2015	2020	2025	2030	2035
City of Riverside RWCQP [a]	Discharge to Santa Ana River	Disinfected, Tertiary	3,674	4,862	5,512	5,643	5,779	5,909
WRCRWA[b]	Discharge to Santa Ana River	Disinfected Tertiary	2,352	3,227	4,529[b]	4,680[b]	4,838[b]	4,988[b]
		Total	**6,026**	**8,090**	**10,041**	**10,322**	**10,617**	**10,897**

a. Projected treated wastewater flow discharge to the Santa Ana River from the City of Riverside RWCQP is projected to reduce by 475 AFY, beginning in 2010, as a result of projected use of 475 AFY of recycled water that would be available from this plant to irrigate the Indian Hills Golf Course that is currently irrigated by the Empire Water Company using non-potable water wells. Other irrigation locations could be considered in-lieu of Indian Hills Golf Course.
b. For the purpose of planning, about 500 AFY recycled water is projected to be available for non-potable use from the WRCRWA in the JCSD service area; thus, JCSD's contribution of wastewater discharge to the Santa Ana River will be reduced as recycled water is reused.

4.3.3 Other Potential Sources of Recycled Water

During the preparation of the JCSD's 2008 and 2010 non-potable water evaluations, JCSD has explored and evaluated other potential sources of recycled water that could be utilized for irrigation purposes, as described below.

4.3.3.1 Inland Empire Utility Agency

IEUA is located north and west of JCSD and encompasses the Cities of Ontario, Chino, and Chino Hills and other cities and water districts within the Chino Basin (Figure 4-1). Sewer service is provided by IEUA to over 700,000 people who generate over 70,000 AFY of wastewater. IEUA currently operates four water reclamation facilities which treat approximately 50,000 AF of water each year to recycling standards. As of November 2007, the total utilization of IEUA's recycled water was approximately 5,800 AFY (Webb, 2008). IEUA's effluent receives tertiary treatment meeting full body contact recreation standards.

Although JCSD is not a member agency of IEUA, IEUA has indicated in past meetings with JCSD that recycled water is available for JCSD to purchase and that distribution facilities currently exist to deliver water within 6,300 feet of the JCSDS's northerly boundary in the Eastvale Area. The closest point of connection from IEUA's recycled water distribution system is on Carpenter Avenue. Distribution facilities do not currently exist which could deliver water to the central and easterly portions of JCSD. IEUA's current recycled water master plan contemplates delivering a total of 1,850 AF of reclaimed water to the JCSD each year.

JCSD has been exploring the feasibility of utilizing reclaimed water from the IEUA for irrigation purposes. A potential alternative was developed as part of the JCSD's 2007 non-potable water evaluation. Reclaimed water from IEUA was proposed as the main supply source of water to irrigate the Eastvale area. IEUA has an existing 30-inch diameter line at the corner of Remington Avenue and Carpenter Avenue. Based on conversations with IEUA JCSD's projected annual demand (1,650 AFY) can be met through a connection to IEUA's recycled water distribution system in this area. However, to meet the estimated peak hour demands (10,000 gpm) from the JCSD, additional storage and distribution system improvements will likely be required.

4.3.3.2 Indian Hills Wastewater Treatment Plant

The Indian Hills Wastewater Treatment Plant (WWTP) was constructed in 1980. It is located on the north side of Limonite Ave near the entrance of the Indian Hills Golf Course (Figure 4-1). In February 2006, JCSD decommissioned this plant due to reported high operation and maintenance costs (Webb, 2010). The primary user of the treated water was Indian Hills Golf Course that is currently served with non-potable water wells by Empire Water Company.

As part of the JCSD's 2010 non-potable water evaluations, the potential cost of reactivating/reconstructing of this plant was evaluated for producing tertiary effluent for irrigation use (Webb, 2010). The evaluation showed that the project cost of reconstructing a conventional 1.0 MGD plant would be $9.7 million compared to $11.4 million for a 1.0 MGD membrane bioreactor plant. JCSD would still utilize the City of Riverside RWCQP to treat a portion of JCSD's wastewater. JCSD is projected to need an additional 1 MGD of wastewater treatment plant capacity to provide service to JCSD's original service area (prior to the annexation of the

Eastvale area) by this plant (excluding industrial/commercial facilities located within the Community Facilities District Area No. 1 and the Eastvale Area). The cost of acquiring 1 MGD capacity from the City of Riverside RWQCP was estimated to be about $10.5 million (based on the City of Riverside Technical Advisory Committee Agenda, August 20, 2008). Even though the cost of acquiring 1 MGD of additional treatment plant capacity at either Indian Hills WWTP or at the City of Riverside RWCQP is comparable, there is a benefit of having a source of tertiary reclaimed water within JCSD's service area which can be used for irritation purposes. However, at this time, JCSD's 20-year Capital Improvement Program does not have recycled water projects, including the reconstruction of the Indian Hills WWTP. Implementation of any recycled water projects is pending funding availability.

4.3.3.3 Summary of Available Source Water Flows

During the JCSD's 2008 and 2010 non-potable water evaluations, JCSD identified various potential alternatives that could potentially provide recycled water for irrigation in the JCSD service area. These studies also evaluated three sources of recycled water suppliers that could potentially participate in the development of recycled water projects (Table 4-1). By utilizing recycled water from these potential sources that already produce recycled water for irrigation and other non-potable purposes, JCSD can more efficiently allocate its potable water supply and increase the overall reliability of water supplies in the service area. These potential sources of recycled water and facilities are described below.

For planning purposes, recycled water from the City of Riverside RWCQP is projected to be available by 2020, as shown in Table 4-5, to meet irrigation water demand at Indian Hills Golf Course or an equivalent non-potable water demand. In the 2010 non-potable water evaluations, this alternative was developed and recommended for future consideration as a viable alternative for the northeast portion of the JCSD (Webb, 2010). JCSD will coordinate with the City of Riverside RWQCP to determine the quantity of recycled water available and the pumping ability of the plant to meet JCSD's pressure and demand requirements (Webb, 2010).

Table 4-5
Summary of Available Source Water Flows

Source	Current Capacity (MGD)	Projected Capacity (MGD)	Projected to be Available for Non-Potable Use (AFY)
City of Riverside RWCQP	3.3 [(a)]	5.7 [(b)]	475
WRCRWA	2.1 [(c)]	4.9 [(b)]	0
		Total	**475**

a. Source: Annual average based on metered data from January 2006 to June 2007, reported as 3.28 MGD (approximately 3,674 AFY) in Appendix C of the 2007 Addendum Master Sewer Plan, prepared by Webb Associates (2007) for JCSD.
b. Source: Table 4 in the 2007 Master Sewer Plan Addendum, prepared by Webb Associates for JCSD (October 2007).
c. Source: Annual average based on metered data from April 2007 to September 2007, as reported as 2.1 MGD (approximately 2,352 AFY) in Appendix C of the 2007 Addendum Master Sewer Plan, prepared by Webb Associates (2007) for JCSD.

4.4 Recycled Water Demand

In this section, current recycled water use is discussed, and potential recycled water users within JCSD's service area are identified as determined from the JCSD's 2008 and 2010 non-potable water master plans (Webb, 2008, 2010). These two studies are briefly described below to summarize existing and potential non-potable water users, including recycled water.

4.4.1 Current Use

Currently, recycled water is not served by JCSD to landscape irrigation customers in the JCSD (Table 4-6). Non-potable water demand is supplied by potable water and non-potable water wells. Currently, JCSD and other entities irrigate approximately 42 percent of their total and projected future irrigation demands with non-potable well water (Webb, 2008).

Table 4-6
Actual Recycled Water Uses

Type of Use	Treatment Level	Actual 2010 Use (AF)
Landscape	Disinfected tertiary	0
Total		**0**

4.4.2 Potential Users

Potential recycled water users were mainly identified through JCSD's two recent non-potable water evaluations, as listed and described below:

- Draft 2008 Non Potable Water Master Plan (Webb, 2008)
- 2010 Non-Potable Water Evaluation in the Eastern Portion of JCSD Service Area (Webb, 2010)

In the JCSD service area, total estimated existing non-potable demand is 1,770 AFY and estimated potential non-potable demand is 2,457 AFY. The ultimate irrigation demand is estimated to be 4,227 AFY, which includes the existing non-potable irrigation demand combined with the potential non-potable irrigation demand (Webb, 2008). Currently, existing demand includes parks, schools, reverse frontage, and golf courses, many of which are served by potable sources. Potential non-potable irrigation areas considered in these two studies include parks, schools, reverse frontage areas, golf courses, freeway right of way, and trails.

For planning purposes, recycled water supply of 500 AFY is projected to be delivered by 2015 to meet a portion of the total existing and potential non-potable irrigation demand of 4,227 AFY (Table 4-7). The most likely source of recycled water would be for WRCWRS to replace potable water in the Eastvale area.

Table 4-7
Potential Recycled Water Uses

Type of Use	Treatment Level	Potential Use (AF)				
		2010	2015	2020	2025	2030
Landscape	Disinfected tertiary	0	500	500	500	500
Total		**0**	**500**	**500**	**500**	**500**

4.4.3 2008 Non-Potable Water Master Plan

JCSD's 2008 Draft Non-Potable Water Master Plan was completed by Webb Associates with the following objectives:

- Identify the existing and potential non-potable water (both recycled water and non-potable well water) demands throughout the study areas;
- Determine the non-potable water supply sources available, including non-potable wells and reclaimed wastewater;
- Prepare backbone facility layouts for the proposed non-potable distribution system; and
- Generate cost estimates for the various sources and distribution system alternatives.

The study focused on two general planning areas within the JCSD:

- Eastvale area covers the southwest portion of JCSD. Potential sources of non-potable water considered in the Eastvale area include future or existing wells, IEUA, and WRCRWA.
- Jurupa area covers the central and easterly portions of JCSD. Potential sources of non-potable water considered in the JCSD area include future or existing non-potable wells, and City of Riverside RWQCP.

Several alternatives to deliver non-potable or recycled water were analyzed during the preparation of the draft plan and only the top four alternatives listed below were evaluated in the plan, based on their required existing and proposed infrastructure (e.g., size of pipelines, pumping facilities, storage, and non-potable wells) and their costs (e.g., construction, operations, and maintenance).

- Alternative 1A utilizes non-potable wells to irrigate the majority of the schools and parks in the JCSD service area that are not currently on non-potable water. For this alternative, a total of nine proposed wells were proposed in addition to the five existing wells (Well 40, Well 41, Chino II-Well 1, High School Well, and Well 21). With the proposed facilities for this alternative the JCSD would be able to meet approximately 61 percent of the irrigation demands within the Eastvale area with non-potable water and 63 percent of the irrigation demands in the entire JCSD service area (Table 4-2).
- Alternative 1B is essentially the same as Alternative 1A with additional pipeline extensions to supply non-potable water to adjacent irrigation areas. Alternative 1B

utilizes five of the JCSD's non-potable wells, nine new wells to irrigate areas throughout the service area. Approximately 75 percent of the ultimate irrigation demands in the Eastvale area can be satisfied with the existing and proposed facilities in this alternative and 71 percent of the demands in the entire JCSD service area.

- Alternative 2 utilizes water from IEUA as the main supply source of water to irrigate the Eastvale area. IEUA has an existing 30-inch diameter line at the corner of Remington Avenue and Carpenter Avenue. Based on conversations with IEUA JCSD's projected annual demand (1,650 AFY) can be met through a connection to IEUA's recycled water distribution system in this area. However, to meet the estimated peak hour demands (10,000 gpm) from the JCSD, additional storage will be required. A 5 million gallon reservoir would have enough storage volume to allow utilization of IEUA's reclaimed water.
- Alternative 3 utilizes treated water from the WRCRWA and would require storage and pumping facilities to supply recycled water for irrigation in the Eastvale area. WRCRWA currently has no available storage for treated effluent; thus, this alternative would require an estimated 5 million gallon reservoir for operational storage. WRCRWA currently has a large enough foot print to house a storage tank and booster station and treats enough wastewater to meet JCSD's estimated total non-potable irrigation demand of 2,068 AFY in the Eastvale area (existing demand of 413 AFY and potential demand of 1,655 AFY).

Table 4-8 summarizes the four alternatives, including their unit cost and the portion of total demand that would be served by each alternative. The unit cost of water varied from $1,022 per acre-foot for Alterative 1A to $1,751 per acre-foot for Alternative 3. Not reflected in this cost estimate is the contribution of funding (e.g., a government grant) on the unit cost of water. At this time, JCSD's highest marginal cost of water is its' CDA water which is at $780 per acre-foot before Metropolitan's projected rebate of $250 per acre-foot (Webb, 2008). Using the JCSD's highest marginal cost of potable water, and comparing it with the estimated cost of non-potable water, it is more economical to use the existing groundwater supply as long as that source continues to be available. The reason for the significant difference between the cost of developing the non-potable system for irrigation purposes and using the existing potable system is a result of the need to construct a separate non-potable pipeline distribution system while the potable system has already been constructed by the JCSD and/or developers in the region.

Table 4-8
Potential Non-Potable Water Alternatives for Eastvale and Jurupa Areas from 2008 Non-Potable Master Plan

Alternative	Estimated Project Cost (in millions) [(a)]	Unit Cost of Non-Potable Water	Demands Served by Alternatives	Percent of Total Ultimate Demand Served [(c)]
Alternative 1A	$7.2	$1,022/AF	857 AFY Eastvale; 50 AFY Jurupa; 907 AFY total	61% Eastvale; 65% Jurupa; 63% total
Alternative 1B	$12.6	$1,198/AF	1,133 AFY Eastvale; 103 AFY Jurupa; 1,236 AFY total	75% Eastvale; 67% Jurupa; 71% total
Alternative 2	$28.8	$1,473/AF	1,616 AFY Eastvale; 0 AFY Jurupa; 1,616 AFY total	98% Eastvale; 63% Jurupa; 80% total
Alternative 3	$33.7	$1,751/AF	1,616 AFY Eastvale; 0 AFY Jurupa; 1,616 AFY total	98% Eastvale; 63% Jurupa; 80% total

a. Source: Table 5-1 in the Draft Non-Potable Water Master Plan, prepared by Webb Associates for JCSD (October 2008).
b. Source: Table 6-1 in the Draft Non-Potable Water Master Plan, prepared by Webb Associates for JCSD (October 2008).
c. Source: Table 4-8 in the Draft Non-Potable Water Master Plan, prepared by Webb Associates for JCSD (October 2008).

Although the cost of water that would be served by these alternatives would be higher than JCSD's current highest cost ($780 per acre-foot), it is expected that the demand for potable water will increase as well as the cost to produce it. By implementing these alternatives, JCSD could free up between an estimated 907 AFY (Alternative 1A) and 1,616 AFY (Alternatives 2 and 3) of future potable water demand. Alternative 1A, development of additional non-potable wells, is the most economical means studied in this plan to both utilize available non-potable water for irrigation and at the same time reduce potential potable water demand. Currently the JCSD and others irrigate approximately 42 percent of the total existing and future irrigation demands with non-potable well water. By implementing Alternative 1A, the JCSD would increase this percentage to an estimated 63 percent throughout the service area (Table 4-8). Although the other alternatives provide more non-potable water supply to meet the JCSD's estimated irrigation demands, they are cost prohibitive unless another funding source becomes available such as government grants to make it more feasible from the cost perspective. The JCSD is encouraged to actively pursue grant funds to reduce the financing cost of using non-potable water (Webb, 2008).

4.4.4 2010 Non-Potable Water Master Plan

The 2010 Non-Potable Water Master Plan further evaluated the feasibility of supplying non-potable (reclaimed water or untreated well water) in the northeast portion of the JCSD (Webb, 2010). The subject area is the same as the JCSD area indicated in the 2008 Non-Potable

Master Plan The 2010 non-potable water evaluations identified three potential sources of additional non-potable water use in the eastern portion of the service areas: non-potable groundwater from the Riverside Basin (Wells 21 and 5), reclaimed water from the City of Riverside RWCQP, and the viability of reactivating the Indian Hills WWTP, which is currently closed, and reclaimed water from the proposed reconstruction of the Indian Hills WWTP. The four options that were evaluated are presented in Table 4-9 and summarized below:

- Option 1 utilizes one of the JCSD's existing non-potable well (Well No. 21) or possibly drilling a second well near the Well No. 21 site to provide non-potable water to potential non-potable water uses that were previously identified. This option also utilizes JCSD's 3 million gallons Sunnyslope reservoir for storage of non-potable water to meet the potential non-potable irrigation demands.
- Option 2 utilizes Empire Water Company's existing distribution system to convey non-potable water from a new well and installing a new pump and motor at Patriot High School, at the existing non-potable pump station site to pump water to JCSD's 3 million gallons Sunnyslope reservoir for storage of non-potable water to meet the potential non-potable irrigation demands.
- Option 3 proposes to reconstruct the Indian Hills WWTP to provide the JCSD an additional 1.0 MGD of wastewater treatment capacity and recycled water for irrigation purposes at the Indian Hills Golf Course. Option 3 would remove the Indian Hills Golf Course from Empire Water Company's system, thereby freeing up Empire Water Company's wells to serve other irrigation areas currently served with potable water.
- Option 4 utilizes recycled water from the City of Riverside RWQCP to meet the JCSD's irrigation demands in the eastern portion of the service area, thus freeing up groundwater in the Riverside Basin to be used for purposes other than irrigation.

As a result of implementing these proposed options, JCSD could potentially save from 489 AFY to 1,550 AFY of potable water by providing recycled water to the existing and future irrigation areas, as shown in Table 4-9. Among the four options evaluated, Option 2 is the most economical. However, Option 4 offers the advantage of freeing up groundwater from the Riverside Basin by using recycled water from the City of Riverside RWCQP that would otherwise be disposed of in the Santa Ana River.

Table 4-9
Potential Non-Potable Water Options in Eastern Portion of JCSD from 2010 Non-Potable Master Plan

Options	Estimated Project Cost (in millions)	Proposed Water Supply (AFY)
Option 1	$5.68 [(a)]	39.5 AFY potable well; and 929 AFY non-potable well
Option 2	$5.43 [(b)]	39.5 AFY potable well; and 1,510 AFY non-potable well
Option 3	$6.27 [(c)]	25.8 AFY potable well; 1,035 AFY non-potable well; and 489 AFY recycled water
Option 4	$10.45 [(d)]	1,550 AFY recycled water

a. Source: Table 4-1 in the Non-Potable Water Evaluation in the Eastern Portion of JCSD Service Area, prepared by Webb Associates for JCSD (November 2010).
b. Source: Table 4-2 in the Non-Potable Water Evaluation in the Eastern Portion of JCSD Service Area, prepared by Webb Associates for JCSD (November 2010).
c. Source: Table 4-3 in the Non-Potable Water Evaluation in the Eastern Portion of JCSD Service Area, prepared by Webb Associates for JCSD (November 2010). Does not include cost of reconstruction of Indian Hills WWTP of $9.7m - $11.4 m as discussed in Section 4.3.3.2.
d. Source: Table 4-4 in the Non-Potable Water Evaluation in the Eastern Portion of JCSD Service Area, prepared by Webb Associates for JCSD (November 2010).

4.4.5 Potential Recycled Water Demand

JCSD has been exploring the feasibility of utilizing reclaimed water from the City of Riverside RWCQP facility for irrigation purposes. Potential non-potable water demands have been described in Tables 4-8 and 4-9 whereby a non-potable water demand of up to 1,500 AFY has been identified in the Eastern or Jurupa portion of the service area and up to 1,600 AFY of demand has been identified in the Eastvale portion of the service area. The non-potable demand can be met by either non-potable groundwater or recycled water.

In this Plan, it is projected that up to 500 AFY of recycled water will be developed using recycled water from the WRCWRA plant. JCSD has been working with Western MWD staff to discuss the feasibility of recycled water options from the plant. The feasibility of tying into this proposed system is a viable alternative but a decision will need to be made in an expeditious manner to avoid major rework to the plans currently being designed. Reclaimed water could be used for to replace potable water for irrigation in the Eastvale Area of JCSD.

Table 4-10
Projected Potential Future Use of Recycled Water in Service Area

Type of Use	Projected Use (AF)				
	2010	2015	2020	2025	2030
Landscape	0	500	500	500	500
Total	0	500	500	500	500

4.4.6 Recycled Water Comparison

JCSD's 2005 UWMP projected no recycled water use in the future, as shown in Table 4-11, but indicated that JCSD was reviewing master plan design at the time of the 2005 UWMP preparation. As explained earlier in this section, JCSD has completed two non-potable water evaluations that were referred to in the 2005 UWMP. These two plans identified both existing and potential demand for non-potable water (recycled and non-potable well water) and required infrastructure in the JCSD service area. Implementation of potential viable alternatives identified in these evaluations is pending future grant funding availability.

As the use of recycled water has gained wide support in the JCSD service area, the 2005 UWMP also mentioned that all construction for parks and reverse frontages were designed with recycled water in mind.

Table 4-11
Recycled Water Uses - 2000 Projection Compared with 2004 Actual

User Type	2005 Projection for 2010 (AF)	2010 Actual Use (AF)
Landscape	0	0
Total	**0**	**0**

4.5 Methods to Encourage Recycled Water Use

Table 4-12 lists actions taken by JCSD to promote recycled water use and other actions that can be taken in the future to encourage the use of recycled water as a viable water source. JCSD has been involved with public outreach and coordinating with local entities, local water agencies, regional wastewater agencies, and other planning agencies to discuss the feasibility of using recycled water in lieu of potable or non-potable groundwater that is currently used for irrigation. In this Plan, it is projected that some level of recycled water use may potentially result from these ongoing efforts. This regional planning and coordination effort should continue to the extent possible as a project develops toward implementation. At this time, while JCSD is in communications with agencies to promote the use of recycled water, it is not possible to determine specifically how much recycled water will result from JCSD's ongoing efforts.

In the case of JCSD, funding availability, securing grant funding, and financial incentives are among the factors that will play a big role in the future implementation of recommended recycled water projects. As mentioned earlier, JCSD completed detailed evaluations of potential alternatives and projects to use recycled water, but implementation of such alternatives, at this time, is pending funding availability, given the high estimated project costs and high unit cost of water when compared to JCSD's current unit cost of potable and non-potable groundwater. State and federal funding, if available, could offset the cost imposed during project construction which typically makes the project cost-prohibitive. Obtaining funding can also help build community support for a project because it results in reduced taxpayer contribution.

Table 4-12
Methods to Encourage Recycled Water Use

Actions	Use Projected to Result From This Action (1) (AF)				
	2010	2015	2020	2025	2030
Local/Regional Planning	0	500	500	500	500
Public Outreach	0	0	0	0	0
State and Federal Funding	0	0	0	0	0
Financial Incentives	0	0	0	0	0
Total	0	500	500	500	500

4.6 Optimization Plan

Recycled water source is not anticipated to be available immediately, mainly due to the high cost of recycled water (and the relative availability of non-potable well water) storage and distribution facilities at this time. Production from the existing regional WWTPs is anticipated to be adequate to meet the total demands of non-potable irrigation demand in the JCSD, especially given the projected increases in the wastewater flow capacities in the regional WWTPs. As potable water demands increase and, consequently, recycled water production increases, the water available to meet non-potable demands would also increase. As described earlier, JCSD has already completed studies to identify both existing and future potential non-potable demands that could be potentially supplied by non-potable sources, thus, freeing up potable supplies currently used to meet portion of irrigation demands. Implementation of the identified recycled water projects are currently pending funding assistance.

Phasing implementation of the recycled water system is recommended for the following reasons:

- Recycled water storage and distribution facilities are not immediately available.
- With the additional pumping capacity, flow of the City of Riverside RWQCP and WRCRWA could be adequate to meet the total demands of potential recycled water users.
- Capital requirements would be spread over JCSD's current planning period through 2035.

In general, the following factors were considered in developing a phasing plan:

- Funding availability
- Ease or willingness of customers to connect to recycled water
- Retrofit costs
- Regulatory requirements
- Community impacts and development requirements
- Water utility involvement/cooperation
- Reliability and operational costs considerations
- System flexibility

The implementation phases are prioritized based on the status of the users (existing or future), the anticipated construction schedule of future users, and the proximity of the users to the non-potable water source (e.g., City of Riverside RWCQP)

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Section 5: Water Quality

5.1 Overview

The quality of any natural water is dynamic in nature. This is true for the local groundwater of the Chino Basin. During periods of intense rainfall or snowmelt, routes of surface water movement are changed; new constituents are mobilized that are often dependent on local land use and enter the water while other constituents are diluted or eliminated. The quality of water changes over the course of a year. These same basic principles apply to groundwater. Depending on water depth, groundwater will pass through different layers of rock and sediment and leach different materials from those strata. Water depth is a function of local rainfall and snowmelt. During periods of drought, the mineral content of groundwater increases.

Water quality regulations also change. This is the result of the discovery of new contaminants, changing understanding of the health effects of previously known as well as new contaminants, development of new analytical technology, and the introduction of new treatment technology. All water purveyors are subject to drinking water standards set by the Federal Environmental Protection Agency (EPA) and the California DPH. JCSD provides local groundwater, desalinated water from the CDA, and transfers of groundwater from the Riverside Basin from the Rubidoux CSD for JCSD's potable supply. An annual Consumer Confidence Report (CCR) is provided to all residents who receive water from JCSD. CCR for 2006 – 2009 are found in Appendix H. That report includes detailed information about the results of quality testing of the water supplied during the preceding year (CCR,2006-2009).

The quality of water received by individual customers will vary depending on the groundwater source and level of treatment. Customers may receive water from one well at one time and water from another well at a different time, or blends of well and CDA water at other times. The source of supply in any single point in the JCSD distribution system may vary over the course of a day, a week, or a year.

This section provides a general description of the water quality of various water supplies. A discussion of potential water quality impacts on the reliability of these supplies is also provided.

5.2 Imported Water Quality

JCSD does not rely directly on imported water as part of its supply. The dominant supply is from local groundwater however, the groundwater is recharged from surface supplies, some of which may be imported or stormwater from the local watershed. The Chino Basin Watermaster is the oversight agency responsible for recharging and preventing overdraft within the Chino Basin in accordance with the groundwater adjudication described in Section 3. The Chino Basin Watermaster recharges the Basin from the following sources: stormwater recharge, SWP water, and recycled water. SWP water is available from Metropolitan but is not a consistent supply due to drought and environmental considerations. The recharge water received from Metropolitan is currently not treated prior to recharge of the Basin and recycled water from the IEUA may require treatment in the future to reduce total dissolved solids (TDS) levels such that additional salts will not be added to the basin. However, IEUA is currently pursuing source control to reduce salts entering the wastewater treatment plants. Source control includes regulation of salt-regenerating water softeners. The purest source of recharge, stormwater, is captured and percolated via the 46 individual recharge basins with in the Chino Basin Each recharge basin is required to prepare a Water Quality Management Plan, however, the entity overseeing the recharge activities is the Watermaster which aligns the activities of all of the local entities.

The water quality of the imported and storm water is not anticipated to reduce reliability. The constituents of concern within these sources are either treated prior to recharge or the source is considered high quality water.

5.3 Groundwater Quality

The Chino Groundwater Basin was adjudicated in 1978; JCSD is a party to the adjudication and the OBMP is implemented to manage water quality and other factors in the China Basin. Local groundwater generally does not have microbial water quality problems. Parasites, bacteria, and viruses are filtered out as the water percolates through the soil, sand, and rock on its way to the aquifer. Even so, disinfectants are added to local groundwater when it is pumped from wells to protect public health. Local groundwater has very little TOC and generally has very low concentrations of bromide which minimizes the potential for disinfection by-product (DPB) formation. Taste and odor problems from algae are not an issue with groundwater.

The mineral content of local groundwater can be very different than surface water. There have been nitrate and TDS intrusion into the Basin, from previous dairy and agricultural users. With the completion of Chino Basin Desalter I, the construction of Chino Basin Desalter II and JCSD's Roger D. Teagarden Ion Exchange Plant, the treatment plants sufficiently treat these constituents. In addition, the management plans in place for the Basin, the regulatory oversight provided by the Regional Water Quality Control Board (RWQCB) particularly as they relate to salts, when combined with the treatment resulted in the delivered water quality meeting or exceeding the standards set for drinking water by the Federal Government and the California DPH. Thus reliability is not expected to be interrupted by the water quality of Chino Basin. The following sections describe the groundwater quality of the Chino Basin.

5.3.1 Groundwater Quality – Nitrate

The California DPH places nitrate into the health risk category of "acute toxicity." Therefore, a single detection may result in public health concerns. DPH states that "infants below the age of six months who drink water containing nitrate in excess of the MCL may quickly become seriously ill and, if untreated, may die because high nitrate levels can interfere with the capacity of the infant's blood to carry oxygen. Symptoms include shortness of breath and blueness of the skin. High nitrate levels may also affect the oxygen-carrying ability of the blood in pregnant women."

The most probable source of the nitrate levels in the groundwater is past agricultural activities, specifically dairies within the Chino Basin. However, since 2005, JCSD reported that all samples of delivered water were below the State and Federal MCL of 45 mg/L. This is due to JCSD's blending plan within the service area. JCSD has obtained a permit from the California DPH that allows high nitrate water to be blended with lower nitrate waters. This approach results in a level of nitrate consistently below the MCL. A monthly blending report is produced and posted to

JCSD's website showing that JCSD maintains levels of 36 mg/L nitrate. Thus JCSD's program protects the reliability of the supply by managing higher nitrate waters through blending which allows for these waters to be used. JCSD continues to monitor for nitrates to ensure consumer safety.

5.3.2 Groundwater Quality – Chromium

Total chromium in water typically results from steel and industrial activities. Chromium VI is produced from by products of industrial applications and the manufacturing of stainless steel and other alloys as well as having a natural component. The current MCL for total chromium is 50 µg/L (ppb). Chromium VI is currently included as part of the total chromium MCL, however, a Chromium VI Public Health Goal (PHG) is expected to be adopted by the California DPH within a year. The comments to the draft PHG closed February 2011 with a recommended PHG of 0.02 µg/L.

Due to the concerns from chromium, JCSD proactively tested for this constituent in their groundwater and found on average in 2005, chromium VI levels was 0.5 µg/L for groundwater pumped by JCSD and 1.5 µg/L from Chino Desalter I. JCSD will continue to evaluate options for Chromium VI treatment and blending options since the adoption of the PHG is now eminent.

5.3.3 Groundwater Quality- Total Dissolved Solids

Total Dissolved Solids is not considered a public health risk but rather relates to the aesthetic quality of water. Depending on the location and water usage, TDS can contribute to the corrosion of metal surfaces or have deleterious effects on sensitive crops. Taste however, is the driving force behind the secondary MCLs from the state. Past customer surveys performed by the US EPA indicated that around 300 mg/L of TDS taste was acceptable and not acceptable around 1000 mg/L. Based on these taste surveys, a threshold of 500 mg/L was established for dissolved solids with an upper limit of 1000 mg/L.

Agricultural activities in the region have led to higher TDS levels in the groundwater. The RWQCB regulates TDS through the Basin Plan Amendment adopted in 2004, that established salt balances for each of the impacted groundwater basins and regulates the discharge of additional salts to the Chino Basin. To prevent the further degradation of the groundwater, the Chino Basin Watermaster monitors the TDS levels from the various sources that are used to recharge the Chino Basin. This has led to the source waters rarely exceeding the recommended secondary MCL and they have <u>not</u> exceeded the upper limit of the secondary MCL based on the 2005-2009 CCRs. JCSD is committed to serving the highest quality of water to their customers and will continue to invest in treated waters that remove salt such as the water acquired from the CDA. The CDA contributes to the reliability of the supply through the removal of salts from local groundwater in their desalting facilities which ensures meeting Federal and State standards.

5.3.4 Groundwater Quality- 1,2,3 TCP

1,2,3- Trichloropropane (1,2,3-TCP) typically is associated with paint and varnish removal, degreasing agent, and a cleaning solvent. More recently 1,2,3 TCP was used to produce pesticides specifically soil fumigants. This constituent has been classified as a carcinogen and is listed as such under Title 22. No MCL has been set for 1,2,3-TCP but a notification limit of 0.005 µg/L from the CDPH serves as the mechanism to create awareness of this chemical. The PHG for 1,2,3-TCP was set at 0.0007 µg/L in August 2009.

JCSD proactively monitors for this chemical and reports the findings in the annual CCR. 1,2,3 TCP has been detected in groundwater from the 870 zone at levels of non-detectable to 42 ng/L (0.042 µg/L). However, water in Zone 870 is blended with other waters such that 1,2,3-TCP is reduced in the delivered water.

5.4 Aquifer Protection

The greatest threats to the Chino Basin are agricultural activities through pesticides and the raising of livestock on dairies which contributed to high nitrate and TDS levels and recycled water recharge. Urbanization of the area has reduced the agricultural threat to the groundwater and few agricultural activities are now present in the region. Also, the Chino Basin Watermaster ensures that the TDS loading from recycled water and imported water sources is balanced within the basin so as not to further increase already elevated TDS levels. The CBWM has established a salt balance for the Basin. One aspect of that salt balance is to balance recycled water TDS levels with the amount of salt that is discharged or desalted from the Basin. The recycled water TDS levels for the various agencies have been established in the OBMP Phase I in August 1999. Other recycled waters within the region have specified TDS levels that must be achieved prior to use.

5.5 Water Quality Impacts on Reliability

As introduced in Section 3, three factors affect the availability of groundwater: sufficient source capacity (wells and pumps); sustainability of the groundwater resource to meet pumping demand on a renewable basis; and protection of groundwater sources (wells) from known contamination, or provisions for treatment in the event of contamination. The first two of those factors are addressed in Section 3. The third factor, the impact and resolution of contamination, is being addressed for the Chino Basin as follows.

5.5.1 Groundwater Contamination (TDS and Nitrate)- Chino Basin

Salt and nitrate in the Chino Basin is the greatest concern for water quality with the southern part of the basin having the highest TDS and nitrate levels of >500 mg/L. These levels are above the recommended secondary MCL of 500 mg/L. To compound the water quality issue, there are no other natural outlets for the salt or nitrates with the exception of Chino and Mills Creek that seasonally release 11,000 AF of groundwater coming to the surface. Other outlets of salt and nitrate within the Chino Basin include the transport of recycled water out of the Basin and the IEBL which transports Brine for discharge into the Pacific Ocean.

The CBWM has identified three management practices to mitigate this contamination to ensure water quality does not impact the reliability of this groundwater supply. These management practices include: minimizing agricultural activities, desalting the water, and maximizing the stormwater recharge of the Basin. The agricultural activities have been minimized with increased urbanization and recharge basins are operated to obtain the greatest levels of percolation from storm water. Desalting the water has been key to reducing TDS and nitrate levels in the Basin. The Chino Desalters provide a source of supply through desalting the water and transporting excess salts and nutrients in the form of brine out of the Basin through the IEBL .

Thus the management practices of salt and nitrate balance, desalting for removal, and recharge leads to a sustainable supply of water from the Chino Basin. Therefore, no reductions to supply are expected from any of the constituents listed in this section especially salt and nitrate (Table 5-1).

Table 5-1
Current and Projected Water Supply Changes Due to Water Quality-Percentage Change

Water source	2010	2015	2020	2025	2030
Groundwater					
Chino Basin	0%	0%	0%	0%	0%

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Section 6: Reliability Planning

6.1 Overview

The Act requires urban water suppliers to assess water supply reliability that compares total projected water used with the expected water supply over the next twenty years in five year increments. The Act also requires an assessment for a single dry year and multiple dry years. This section presents the reliability assessment for JCSD's service area.

It is the stated goal of JCSD to deliver a reliable and high quality water supply for their customers, even during dry periods. Based on conservative water supply and demand assumptions over the next 25 years in combination with conservation of non-essential demand during certain dry years, the Plan successfully achieves this goal.

6.2 Reliability of Water Supplies

Each water supply source has its own reliability characteristics. In any given year, the variability in weather patterns around the state may affect the availability of supplies to the Chino Basin. For example, from 2000 through 2002, southern California experienced dry conditions in all three years. JCSD was able to provide sufficient water due to a diverse portfolio which currently includes a connection to another agency (Rubidoux CSD), access to the CDA, and local groundwater including a lease of up to 1,200 AFY of water rights from the SARWC. Membership to CDA also allows for access to other sources of supply from the 6 other CDA members (Western MWD, SARWC, Cities of Ontario, Norco, Chino, and Chino Hills), further increasing reliability. To ensure reliability, JCSD intends to increase their water portfolio by pursuing water from Western MWD via the Riverside Corona Feeder, the Riverside Basin, and recycled water. If one supplier reduces deliveries then additional supply can be acquired through other supplies.

As discussed in Section 3.3, JCSDs supply comes nearly entirely from the Chino Basin distributed amongst various suppliers. An assumption associated with the adjudication of the Basin was that all suppliers would be allowed to pump sufficient groundwater from the Basin. The Chino Basin Watermaster has the responsibility of ensuring sustainable use of the groundwater within the region with a declared safe yield of 140,000 AFY. Only when pumping exceeds the safe yield does the Watermaster impose assessments to replace overproduction which is called a replenishment obligation. Water pumped in excess of safe yield is available for pumping but is charged a higher rate in order to cover the cost of replenishment. The 2000 OBMP found in Appendix I protects the basin from overproduction by way of nine elements. A detailed description of the elements can be found in Section 3. The element that could potentially impact JCSD's supply directly is the decisions made in Program Element 2 that addresses the recharge program. The infrastructure developed in this OBMP element is used to balance long-term groundwater production.

Stormwater, imported water from the SWP, and recycled water contribute to the recharge of the Basin. Stormwater recharge is affected by changes in the local hydrology. The amount of SWP water allocated to contractors each year is dependent on a number of factors, including hydrology, that can vary significantly from year to year. The primary factors affecting SWP supply availability include hydrologic conditions in northern California, the amount of water in SWP storage reservoirs at the beginning of the year, regulatory and operational constraints, and the total amount of water requested by the contractors. The availability of SWP supplies to SWP contractors is generally less than their full Table A amounts in many years and can be significantly less in very dry years. DWR's SWP Delivery Reliability Report for 2009, issued in 2010, assists SWP contractors in assessing the reliability of the SWP component of their overall supplies. DWR provided these updated delivery reliability estimates to the SWP contractors for planning purposes. The most recent reports states that the reliability of this water is subject to biological demands and climate change. The affects of SWP delivery does not directly affect JCSD's supplies and only through the actions and responses of the Chino Basin Watermaster to Metropolitan's SWP allocations will the supply potentially change over the long-term. Under current agreements, JCSD's groundwater when pumped in accordance with the Judgment are not anticipated to change regardless of allotments from the SWP.

The Chino Basin depends on local and imported supplies located in two distinct hydrologic regions of the state. As seen previously, a drought in Southern California may not necessarily mean a drought in Northern California exists. The diverse portfolio of the Chino Basin and JCSD ensures a reliable future water supply for the service area. A summary of the factors limiting supplies is found in Table 6-1.

6.3 Normal, Single-Dry. And Multiple-Dry Year Planning

JCSD has various water supplies available to meet demands during normal, single-dry, and multiple-dry years. The following sections elaborate on the different supplies available to JCSD including groundwater and CDA supplies.

Table 6-1
Factors Resulting in Inconsistency of Supply- AFY

Water supply sources	Specific source name, if any	Limitation quantification	Legal	Environmental	Water quality	Climatic	Additional information
Supplier produced groundwater		None			X		Groundwater is monitored per CDPH regulatory requirements and the water meets all MCLs.
Current transfers from Rubidoux CSD		None					
Future transfers from Rubidoux CSD		None					
Desalination – Existing CDA		None					
Desalination – Future CDA		None	X				JCSD has entered into a "take or pay" agreement that requires delivery of a specified amount.
Non-potable groundwater (Existing Chino Basin)		None					
Non-potable groundwater (Existing Riverside Groundwater Basin)		None					

6.3.1 Groundwater

Supplies from local groundwater are projected to be 15,000 to 18,000 AFY in average years and 19,000 to 27,000 AFY in single dry years (Table 6-2 and 6-3); supplies from the CDA are projected to be 8,200 AFY in all year types due to a "take or pay" agreement with the Chino Desalter Authority however additional supply will come online by 2015 which will reduce groundwater pumping by 3,300 AFY. This supply could be used in addition to the pumping or could be in lieu of groundwater pumping to meet dry year demands. Non-potable supplies satisfy landscape demands and may increase in dry years associated with elevated temperatures. The non-potable supplies generally irrigate golf courses, schools and medians which use grasses. During times of elevated temperatures and reduced rain, the landscape will require more irrigation to compensate for the lower levels of rainfall and higher evapotraspiration rates. Most supply sources in JCSD are defined quantities, however, deficits will be satisfied with local groundwater. Overall, the Chino Basin is considered a reliable supply as the recharge is managed through the Chino Basin Watermaster with local and Metropolitan replenishment water. In the 2010 RUWMP Metropolitan indicated that it will be able to meet all demands during the next 20 year planning period. Even during multiple dry year periods with an assumed 10% increase in demand, the demand will be met. In addition, a regional message from Metropolitan regarding water conservation during dry years, which can be reinforced by JCSD, will likely minimize increases in dry year demand.

Table 6-2
Supply Reliability-Current Water Sources- AFY

Water supply sources	Average/Normal Water Year Supply	Single Dry Water Year Supply[a]	Multiple Dry Water Year Supply			
			2009[a]	2010[a]	2011[a]	2012[a]
Supplier produced potable groundwater from Chino Basin	13,586	15,952	15,952	16,924	17,896	18,688
Desalination – Existing CDA	8,676	8,676	8,676	8,676	8,676	8,676
Current transfers from RCSD	679	679	679	679	679	679
Non-potable groundwater (Existing Chino Basin)	212	212	212	212	212	212
Non-potable groundwater (Existing Riverside Groundwater Basin)	507	507	507	507	507	507
Total	23,660	26,026	26,026	26,998	27,970	28,942
Percent of normal year:		110%	110%	114%	118%	122%

a. Supply increases based on 2009 demand and 10% demand increase in each dry year (a conservative assumption). The single dry year and year 1 of the multiple dry years were assumed to be the same. Demand increases for 2010 - 2013 is proportional to average increase between 2010 and 2015.

Table 6-3
Supply Reliability for a Single Dry Year -Current and Future Supplies- AFY

	2009	2015	2020	2025	2030	2035
Supplier Produced Potable Groundwater from Chino Basin [(a)]	15,952	16,702	17,138	16,266	15,427	14,058
Desalination - Existing CDA Purchase [(b)]	8,676	8,200	8,200	8,200	8,200	8,200
Desalination - Future CDA Purchase[(b)]	-	3,300	3,300	3,300	3,300	3,300
Future Transfer from Metropolitan/Western MWD [(c)]	-	-	5,000	6,500	8,000	10,000
Supplier Surface Diversions	-	-	-	-	-	-
Current Transfers from Rubidoux [(d)]	679	500	500	500	500	500
Future Transfers from Rubidoux [(d)]		1,000	1,000	1,000	1,000	1,000
Exchanges In or out	-	-	-	-	-	-
Other						
Total Potable	**25,307**	**29,702**	**35,138**	**35,766**	**36,427**	**37,056**
Chino Basin - Existing Non-Potable Groundwater [(e)]	212	200	200	200	200	200
Groundwater - Non-Potable (Riverside Basin) [(f)]	507	600	600	600	600	600
Non-potable groundwater (Future Chino Basin) [(g)]	-	857	857	857	857	857
Recycled Water (projected use) [(h)]	-	500	500	500	500	500
Total Non-Potable	**719**	**2,157**	**2,157**	**2,157**	**2,157**	**2,157**
Total Water Supply[(i)]	**26,026**	**31,859**	**37,295**	**37,923**	**38,584**	**39,213**
Total Potential Production Capacity[(j)]	41,900	54,000	54,000	54,000	54,000	54,000

a. Potable groundwater pumping from the Chino Basin pursuant to the Judgment found in Appendix C.
b. Existing CDA pumping as reported in the Dec 2010 JCSD Water Porfolio.xls; Existing CDA includes 3,200 AFY from Chino I Desalter and 5,000 AFY from Chino II Desalter. Future CDA includes 3,300 AFY from Chino II Desalter Expansion.
c. Represents potential demand projections on Western MWD for JCSD (JCSD, 2010a).
d. Existing and future transfer from Rubidoux CSD (Personal Communcation, 1/31/11)
e. Portion of non-potable irrigation pumping supplied by non-potable wells in Chino Basin. (JCSD, 2010b)
f. JCSD non-potable Well 21 and Well 5 in the Riverside Basin serving Oak Quarry Golf Course. (JCSD, 2010b).
g. Planned potable to non-potable water conversion. (Webb, 2008)
h. Planned conversion from non-potable groundwater to non-potable recycled water in Jurupa Eastside area (Webb. 2010b)
i. Projected demand as presented in Section 2 with 10% increase for higher evapotranspiration in dry years .

6.4 Supply and Demand Comparisons

The available supplies and water demands for JCSD's service area were analyzed to access the region's ability to satisfy demands during three scenarios: a normal water year, single-dry year, and multiple-dry years. The tables in this section present the supplies and demands for the various drought scenarios for the projected planning period of 2010-2035 in five year increments. Table 6-4 presents the base years for the development of water year data. The Chino Basin depends on water from Metropolitan for recharge thus the safe yields established for the basin will partly depend on the ability for Metropolitan to deliver water. Previously described in Section 2, the Dry-Year Yield program is a joint effort between Metropolitan and the Chino Basin Watermaster which reduces the importation of SWP water during dry years by increasing the pumping of groundwater. In converse, during wet or normal years, groundwater pumping returns to normal levels and imported water is increased to replenish the Basin. In their 2010 RUWMP plan, Metropolitan indicates that for the next 20 years, the agency will be able to meet 100% of all their demands. Thus reductions in pumping, if any, will ultimately be driven by Metropolitan's ability to provide recharge supplies over the long-term. Tables 6-5, 6-6, and 6-7 at the end of this section summarize, respectively, Normal Water Year, Single-Dry Water Year, and Multiple-Dry Year supplies.

Table 6-4
Basis of Water Year Data

Water Year Type	Base Years
Normal Water Year	2004
Single-Dry Water Year	1977[a]
Multiple-Dry Water Years	1990-1992[a]

a. From 2010 RUWMP Metropolitan

6.4.1 Normal Water Year

Table 6-5 summarizes JCSD's water supplies available to meet demands over the 20-year planning period during an average/normal year.

6.4.2 Single-Dry Year

The water supplies and demands for JCSD's service area over the 20-year planning period were analyzed in the event that a single-dry year occurs, similar to the drought that occurred in California in 1977. Table 6-6 summarizes the existing and planned supplies available to meet demands during a single-dry year. Demand during dry years was assumed to increase by 10 percent based on the average year projections.

6.4.3 Multiple-Dry Year

The water supplies and demands for JCSD's service area over the 20-year planning period were analyzed in the event that a multiple-dry year event occurs, similar to the drought that occurred during the years 1990 to 1992. Table 6-7 summarizes the existing and planned supplies available to meet demands during multiple-dry years. Demand during dry years was assumed to increase by 10 percent based on the single dry year projections.

Table 6-5
Supply and Demand Comparison-Normal Year- AFY

	2010	2015	2020	2025	2030	2035
Supply totals	23,660	28,962	33,905	34,476	35,077	35,648
Demand totals	23,660	28,962	33,905	34,476	35,077	35,648
Difference	0	0	0	0	0	0
Difference as % of supply	0%	0%	0%	0%	0%	0%
Difference as % of demand	0%	0%	0%	0%	0%	0%

Table 6-6
Supply And Demand Comparison-Single Dry Year- AFY

	2010	2015	2020	2025	2030	2035
Supply totals	26,998	31,858	37,296	37,924	38,585	39,213
Demand totals	26,998	31,859	37,295	37,923	38,584	39,213
Difference	0	0	0	0	0	0
Difference as % of supply	0%	0%	0%	0%	0%	0%
Difference as % of demand	0%	0%	0%	0%	0%	0%

Table 6-7
Supply and Demand Comparison-Multiple Dry-Year Events- AFY

		2010	2015	2020	2025	2030	2035
Multiple-dry year first year supply	Supply totals	26,998	31,859	37,295	37,923	38,584	39,213
	Demand totals	26,998	31,859	37,295	37,923	38,584	39,213
	Difference	0	0	0	0	0	0
	Difference as % of supply	0%	0%	0%	0%	0%	0%
	Difference as % of demand	0%	0%	0%	0%	0%	0%
Multiple-dry year second year supply	Supply totals	27,970	32,946	38,382	39,011	39,672	40,300
	Demand totals	27,970	32,946	38,382	39,011	39,672	40,300
	Difference	0	0	0	0	0	0
	Difference as % of supply	0%	0%	0%	0%	0%	0%
	Difference as % of demand	0%	0%	0%	0%	0%	0%
Multiple-dry year third year supply	Supply totals	28,942	28,942	34,033	39,469	40,098	40,759
	Demand totals	28,942	28,942	34,033	39,469	40,098	40,759
	Difference	0	0	0	0	0	0
	Difference as % of supply	0%	0%	0%	0%	0%	0%
	Difference as % of demand	0%	0%	0%	0%	0%	0%

6.4.4 Summary of Comparisons

As shown in the analyses above, JCSD has adequate supplies to meet demands during normal, single-dry, and multiple-dry years throughout the 20-year planning period. There is no difference in the supply and the demand since the local groundwater supplies will be pumped according to the demand. In addition, as shown in Table 3-3, there is more than sufficient production capacity to meet future demands.

Section 7: Water Demand Management Measures

7.1 Background

JSCD recognizes that conserving water is an integral component of a responsible water management strategy and is committed to providing education, tools, and incentives to help its customers reduce the amount of water they use. This section describes the water Demand Management Measures (DMMs) implemented by JCSD.

JSCD became a signatory to the Memorandum of Understanding Regarding Water Conservation in California (MOU) of the California Urban Water Conservation Council (CUWCC) in 1994, establishing a firm commitment to the implementation of the Best Management Practices (BMPs) or DMMs. The CUWCC is a consensus-based partnership of agencies and organizations concerned with water supply and conservation of natural resources in California. By becoming a signatory, JSCD committed to implement a specific set of locally cost-effective conservation practices in its service area.

Since the last UWMP in 2005, JCSD has focused its conservation related efforts on “foundational” improvements. These include replacement of meters, adoption of a conservation rate structure, analysis of regional variations in demand and more. These activities represent a new element to the existing programs focusing on good information, appropriate price signals and tracking towards defined goals.

JSCD actively pursues the implementation of the DMMs and as of 2009 is currently meeting their SBx7-7 2020 target of 199 gcpd as reported in Section 2. JCSD will continue actively investing in water efficient practices and programs to ensure that it continues to meet its water savings goals and maintain compliance with SBx7-7 in the future.

7.2 Implementation Levels of DMMS/BMPS

JSCD is subject to the Urban Water Management Planning Act, AB1420 and SBX7-7 requirements, in addition to the commitment of compliance with the BMPs as a signatory to the MOU. In the JCSD service area, demand management is generally addressed at the local (retail agency) levels with support from the regional wholesale agency, Western MWD.

The MOU and BMPs were revised by the CUWCC in 2008. The revised BMPs now contain a category of “Foundational BMPs” that signatories are expected to implement as a matter of their regular course of business. These include Utility Operations (metering, water loss control, pricing, conservation coordinator, wholesale agency assistance programs, and water waste ordinances) and Public Education (public outreach and school education programs). These revisions are reflected in the reporting database starting with reporting year 2009. The new category of foundational BMPs is a significant shift in the revised MOU.

Signatories to the MOU are allowed by Water Code Section 10631(j) to include their biennial CUWCC BMP reports in an UWMP to meet the requirements of the DMMs sections of the UWMP Act. While JCSD has been a signatory since 1994, it has not filed BMP reports with the CUWCC since 2006. Due to the challenges with the development of the CUWCC's database at the time of this draft, the BMP activity information from 2007 through 2010 could not be filed and are therefore is included in this section. The 2006 report is attached in Appendix J. JCSD will file its 2007 through 2010 CUWCC reports in 2011 and when the database is functioning. JCSD will maintain records of all activities and all future CUWCC reporting will be done in a timely way.

The following sections describe the various programs and conservation activities implemented by JCSD and provide an implementation plan for compliance with the UWMP Act, including DMMs and SBX7-7 requirements.

7.3 Foundational BMPs

7.3.1 Utility Operations- Operations Practices

7.3.1.1 Conservation Coordinator

JCSD staff manages the water conservation program as part of their ongoing duties, and they are also supported by outside consultants. However, JCSD recognizes the current staffing will not be sufficient to meet the water conservation targets and to expand the program therefore, JCSD has a water conservation budget of $385,000 for fiscal year 2010 – 2011 and plans to hire a water conservation coordinator and water resource planner as part of the fiscal year 2011 – 2012 budget. JCSD intends to fill these two positions by 2012 to further develop and maintain the additional and expanded water conservation efforts that are identified in JCSD's Strategic Plan. Additionally under the Board of Directors, a conservation committee assesses the need and direction of water use efficiency programs.

7.3.1.2 Water Waste Prevention

JCSD actively pursues incidents of water waste. Incidents of waste are investigated and recommendations for any corrections are provided. Water sources are regulated and can be disconnected in cases of excessive leakage and/or facilities failure.

Ordinance 317 which prohibits the wasteful use of water and is found in Appendix K was adopted by the JCSD board on 24 August 2009. The ordinance includes prohibitions on the excessive use of water, failing to repair leaks, use of water to wash sidewalks, driveways, parking areas, tennis courts, patios or other paved area with the exception of health and safety considerations, irrigation limitations, or use of water prohibited by the water conservation levels. The ordinance also establishes conservation levels in response to a supply shortage. JSCD also has a Water Shortage Contingency Plan of which elements are included in Ordinance 317.

The Ordinance establishes four levels of response actions to be implemented in times of shortage (Response Level 1 through Response Level 4), with increasing restrictions on water use in response to worsening drought conditions and decreasing available supplies. The policy establishes progressive response levels including regulations to be implemented during times of declared water shortages in order to attain escalating conservation goals. These response levels are described in detail in Section 8 – Water Shortage Contingency Plan.

7.3.1.3 Water Loss Control

Production losses are estimated at 10.0 percent based on JCSD staff review of production and consumption data. JSCD has not completed AWWA's M36 Water Loss analysis, which consists of a component analysis of leaks into "revenue" and "non-revenue" categories, among others, and an economic analysis of recoverable loss. JCSD is in the process of assessing its water losses through the required methodology and plans to complete the Water Loss Control assessment pursuant to AWWA M36 by December 2011. JCSD is committed to limiting the amount of water loss and has also required that all temporary sales and construction waters be metered to minimize unaccounted for water attributed to these uses.

7.3.1.4 Metering with commodity rates for all new connections and retrofit of existing connections

All water deliveries provided through the JCSD system are metered and all new water service accounts require meters which are installed, maintained and billed by volume. Large landscapes in the JCSD service area have dedicated irrigation meters, including all landscaped medians and greenbelts, park accounts and golf courses. JCSD has 318 dedicated landscape meters that deliver potable water and 7 agricultural meters that deliver non-potable water to irrigation customers.

JCSD has an active retrofit program with 10,000 meters replaced from September 2010 to December 2010. In addition, the limited agriculture in the region is monitored with individual meters.

7.3.1.5 Retail conservation pricing (formerly BMP 11)

All of JCSD's customers are metered and billed monthly using a tiered rate structure that was adopted through Ordinance 280 in September 2007. The proportion of revenue from volumetric charge has not met the BMP requirement of 70 percent. To date, 54% of the total revenue in fiscal year 2009-2010 was from volumetric charges. JCSD initiated a financial study in 2010 to restructure the rates. JCSD is continuing studies to establish a compliant pricing structure and establishing a rate that would gradually meet a target of 70 percent revenue from volumetric charges. The first phase is expected to take effect June 2011 with a subsequent phase to occur in January 2012 that will likely include a modified budget-based rate structure.The rate restructuring plan will allow JCSD to come into compliance with conservation pricing. The current pricing structure is presented below in Table 7-1 and has resulted in a decrease in per capita water consumption along with other conditions including economic conditions, and a recent drought, in reducing demands since 2008. Since 2006, JCSD has realized a 17% drop in gpcd as a result of these conditions.

Table 7-1
Residential and Commercial Volumetric Rates (per HCF)

	Volume (HCF)	2008	2009	2010	2011[a]
Tier 1	0-20	$0.81	$0.98	$1.14	$1.30
Tier 2	21-50	$1.10	$1.28	$1.47	$1.65
Tier 3	51-100	$1.35	$1.54	$1.72	$1.90
Tier 4	101>	$1.57	$1.76	$1.94	$2.12

a. The planned 2011 phase of rate increase is scheduled to be implemented June 2011 and an alternative pricing structure is under development and planned for adoption in January 2012.

7.3.2 Education

7.3.2.1 Public Information Programs

JCSD's education and outreach activities support conservation programs and enhance customer awareness of conservation. At a minimum, JCSD offers 4 outreach activities per year and reviews or updates water conservation information monthly. Past outreach programs have included the purchase of 4 issues of "Water for Tomorrow" published by ACWA which was distributed to customers within the service area.

JCSD added to its conservation website (http://savewater.jcsd.us) in 2010 and the website provides information regarding rebates, landscaping, and water conservation approaches for residents. Marketing of the website occurred through the quarterly community newsletter, JCSD Community News, which includes articles on conservation in each issue and is sent to all 27,000 customers. The current and archived newsletters are also available on the JCSD website.

JCSD provides representation and information at The Fall Festival and City of Eastvale's Annual Picnic in the Park. Free faucet aerators and other giveaways are distributed at booths during these events.

Marketing techniques used include a specific approach for individual customers and a broad approach to communities relative to the value of water and the importance of conservation. JCSD uses their billings to promote water conservation information. Customer water bills show past water usage and current usage and include inserts with the most current water conservation information. Most recently, water conservation and landscape classes have been offered. JCSD offered on average 2 landscape classes per year. The dates and attendees are presented below.

- April 12, 2008 with 78 attendees

- September 6, 2008 with 34 attendees
- June 6, 2009 with 12 attendees
- November 14, 2009 with 10 attendees
- February 6, 2010 with 7 attendees
- May 22, 2010 with 21 attendees
- September 25, 2010 with 26 attendees

In addition, the Board Water Conservation Committee meetings, which are open to the public, are a venue for education and reporting on JCSD programs.

Additional public outreach activities that reach JCSD customers include:

- Advertisements from Western MWD, regional wholesaler
- Public Service Announcements from Western MWD, regional wholesaler
- District office displays
- Newsletters/brochures/magazines distributed around communities at other business offices
- Educational/informational sessions for commercial, industrial and landscape irrigation customers (coordinated with Metropolitan).

7.3.2.2 School Education Programs

JCSD recognizes the importance of educational benefits and works to provide local students and teachers a variety of education programs and tools. JCSD provides an activity booklet for K-3 students entitled "Water Wonderful." In 2010, JCSD supported a play entitled "Story of Drinking Water" that was presented to kindergarten through sixth graders. For 2011, JCSD has committed a budget to visit all elementary schools (14 schools) within the service area to discuss water conservation utilizing an environmental education organization to present water issues to the students. The same organization was utilized in the past for the education of students in the area of water issues.

7.4 Programmatic BMPS

As described earlier in Section 2, JCSD has chosen the gpcd approach for complying with the MOU. DMM status is described in the following sections.

The cost-effectiveness for the JCSD UWMP was calculated based on an avoided cost of water of $461/AF. The avoided cost was determined using a weighted average calculated from the percent of supply multiplied the various costs of the supply.

7.4.1 Cost Effectiveness Analysis

Part of the evaluation of Programmatic BMPs is the conduct of the CUWCC cost-effectiveness analysis for each BMP. Cost-effectiveness analysis (CEA) compares the costs of a conservation device or activity, measured in dollars (Total Cost in the tables that follow), with its benefits (Total Benefits in the tables that follow), expressed in physical units (for example, $ per AF of savings or Cost of Water in the tables that follow). Costs to customers, capital and operation and maintenance expenditures for conservation programs, program administration and implementation costs, and environmental costs may all be included in the cost of a conservation program.

The CUWCC has provided guidance on these costs in their "BMP Costs & Savings Study: A Guide to Data and Methods for Cost-Effectiveness Analysis of Urban Water Conservation Best Management Practices Program" (2005). Costs and benefits assumptions were based on the CUWCC estimates from the Research and Evaluation Committee Report (R&E, August 2009). The assumptions included decay rates for each program type, administrative costs, and savings per unit in AF. The number of units is determined by the level of compliance necessary as prescribed by the individual BMPs within the MOU. As appropriate, the level of compliance for each BMP for JCSD is reported below in the individual evaluation of the BMP.

Based on the CEA analysis (using an avoided cost of water of $461/AF), the residential assistance program, the residential landscape water audit, high efficiency clothes washers, and Watersense specific toilets were not found to be cost effective because the total benefits are less than total costs. CII use and large landscape water budgets were found to be cost effective but overall BMP compliance will not be through implementation of the individual BMPs but using the gpcd approach.

Where possible, JCSD provides an estimate of expected conservation savings and expects to track savings as the water conservation program further develops. Additional conservation efforts are expected to reduce demand as the service area has not achieved saturation of water conserving devices. Past efforts by JCSD are represented in Table 7-2 below.

Table 7-2
Summary Of Conservation Rebates and Hardware for Programmatic DMMs in the JCSD Service Area[(a)].

	Conservation Type						
Year	High Efficiency Washer	Conductivity Controller	Zero Water Urinal	CCIC	WBIC	Multi-Family HET	Multi-Family HEW
2006	1	0	21	0	0	0	0
2007	0	3	1	0	0	0	0
2008	0	0	18	18	0	0	0
2009	0	0	5	82	0	0	1
2010	0	0	21	0	5	1,238	0
TOTAL:	1	3	66	100	5	1238	1

a. Data summarized from Metropolitan Public Sector Program Master Incentive Summary - Phase I and JCSD Rebate Data from Western MWD.

7.4.2 Residential Programs

The largest customer class in the JSCD service area is residential, accounting for approximately 94 percent of connections and 70 percent of total demand. JSCD has about 25,159 single family (SF) and 268 multi family (MF) residential accounts. JCSD has focused the majority of its conservation efforts on residential use. The number of rebates offered is found in Table 7-2 above and additional summaries of the programs are found in the following sections.

7.4.2.1 Residential Assistance Program and Landscape Water Surveys (former DMMs 1 and 2)

JCSD is combining the Residential Assistance and Landscape Water Survey programs into a single analysis because the program is implemented as a single audit program with indoor and landscape elements. Also, the estimates of costs and savings provided by DWR combine the indoor and landscape elements. JCSD's indoor residential audit program is structured to respond to customer requests and is offered as a free service to all customers within JCSD. A consultant has been contracted to perform the work and, to date 6 single family audits have been performed. Residential landscapes are a significant use in JCSD's service area especially when considering the service area is in a warm, dry climate. JCSD will continue to offer audits as part of their efforts to conserve water.

JCSD is filing for a cost-effectiveness exemption to the survey programs (Table 7-3). At a total cost of $149,145 compared to a total benefit of $60,638, this program is not cost-effective. The analysis was performed using CUWCC assumptions for water savings, decay and program costs and is based on performing 401 surveys per year or 1.5 percent of residential accounts as specified by the MOU. The assumptions are based on CUWCC estimates from Research and Evaluation Committee Report (August 2009) which identify a savings per unit of 0.045 AFY and a decay rate of 10 percent. Administrative costs of 25 percent are assumed and include customer contact, inspection scheduling, marketing materials and follow up.

Table 7-3
Cost Effectiveness Summary: Residential Assistance Program

DWR DMM Review Table	
Cost Effectiveness Summary	
Total Costs	$149,145
Total Benefits	$60,638
Benefit/Cost	0.41
Time Horizon	25 years
Cost of Water	$940
Water Savings (AFY)	159

7.4.2.2 High-Efficiency Clothes Washers (former DMM 6)

JCSD is not currently offering High-Efficiency Clothes Washers (HECW) rebates directly but rebates are available to JCSD customers through Western MWD and Metropolitan. To be in compliance with the MOU, JCSD needs to provide approximately 252 rebates. JCSD could provide customers with a rebate of up to $210/washer; the estimated cost of this program is approximately $73,590 per year which includes the rebate as well as staff time to administer the program. The cumulative savings would be about 197 AF.

Due to the impacts of the economic downturn on JCSD's customers, JCSD is not confident that a cost-effective rebate could provide enough incentive for customers to replace their washers at this time. Additional efforts by JCSD staff to enlist customer participation due to the downturn will increase programs costs at this time. However, as the economic situation changes, the areas of new development projected for 2015-2020 may result in customers seeking such rebates. As a result, JCSD is filing for a cost-effectiveness exemption to the HECW program (Table 7-4). The program costs of $73,590 exceed the benefits of $65,917 from the water savings and is therefore not cost-effective.

The analysis is based on offering 252 rebates as specified by the MOU at $210. The assumptions are based on CUWCC estimates from Research and Evaluation Committee Report (August 2009) which identify a savings per unit of 0.031 AFY and a decay rate of 8 percent. Administrative costs of 25 percent are assumed and include customer contact, inspection scheduling, marketing materials and follow up.

Table 7-4
Cost Effectiveness Summary: High-Efficiency Clothes Washers

DWR DMM Review Table	
Cost Effectiveness Summary	
Total Costs	$73,590
Total Benefits	$65,917
Benefit/Cost	0.90
Time Horizon	25 years
Cost of Water	$373
Water Savings (AFY)	197

7.4.2.3 WaterSense Specification (WSS) toilets (former DMM 14)

JCSD is not currently offering High Efficiency Toilet (HET) rebates directly but rebates are available to JCSD customers through Western MWD and Metropolitan in their service area. The JCSD Board authorized a HET program in cooperation with Western MWD in 2010 which resulted in the installation of 1,238 high efficiency toilets at the Country Village Senior Apartments.

Based on a resale rate for Riverside County of 4.5 percent, the program goal specified by the MOU is a replacement of 228 units per year over 10 years. JCSD is filing for a cost-effectiveness exemption to the WSS toilet program (Table 7-5). At a total cost of $35,323 compared to a total benefit of $30,306, this program is not cost-effective.

The analysis was performed is based on performing 401 surveys per year or 1.5 percent of residential accounts per the MOU. The assumptions are based on CUWCC estimates from Research and Evaluation Committee Report (August 2009) which identify a savings per unit of 0.024 AFY and a decay rate of 4 percent. Administrative costs of 25 percent are assumed and include customer contact, inspection scheduling, marketing materials and follow up.

Table 7-5
Cost Effectiveness Summary: WaterSense Specification (WSS) toilets

DWR DMM Review Table	
Cost Effectiveness Summary	
Total Costs	$35,323
Total Benefits	$30,306
Benefit/Cost	0.86
Discount Rate	2.9%
Time Horizon	25 years
Cost of Water	$413
Water Savings (AFY)	86

7.4.2.4 Water Sense Specification for New Residential Development

The JCSD service area experienced tremendous growth recently with large developments in the Eastvale area. Water efficient rebates and conservation information is provided to new customers through the JCSD website. In addition, JCSD provides free aerators to single family and multi-family residents in an effort to promote water conservation in their developing and older areas. JCSD distributed 2,500 aerators to one of the larger multi-family residents in the area. See Section 2 for discussion of service area characteristics.

The requirements of the DMM is that JCSD provide incentives such as rebates, recognition programs, or reduced connection fees, or ordinances requiring residential construction meeting water sense specifications (WSS) for single and multi-family housing until a local, state or federal regulation is passed requiring water efficient fixtures.

The 2010 California Green Building Standards Code (CAL Green Code, CALGreenCode.pdf) addresses these WSS requirements. CAL Green Code is in addition to current plumbing codes which requires fixtures that use less water for new construction.

The CAL Green Code sets mandatory green building measures, including a 20 percent reduction in indoor water use, as well as dedicated meter requirements and regulations addressing landscape irrigation and design. The Code also identifies voluntary measures that set a higher standard of efficiency. JCSD has two newly incorporated cities which have the authority to adopt this code. The City of Eastvale adopted Ordinance 2010-08 on January 12, 2011 implementing the CAL Green Code. The City of Jurupa Valley has yet to adopt any codes as this city has just been incorporated as of 2011. However; most of the service area is close to build out so Cal Green Code adoption may not be appropriate. Based on the Riverside County General Plan and the 2010 Demand Analysis Study, JCSD assessed that 9% of the projected demand from total build out with in the service area represents new development.

7.4.2.5 Commercial, Industrial, and Institutional (CII) BMPs

Based on 2009 deliveries of 3,785 AF which equates to 8% of total use, the CII sector must reduce consumption by 379 AF by 2020, or about 38 AFY. There is no large industry in JCSD, however golf courses are also classified as “industrial” use. JCSD irrigates one golf course at 601 AFY with non-potable water. JCSD is exploring the potential of irrigating the golf course with recycled water which would satisfy the requirement of 379 AF by 2020 with the conversion of one golf course. Recycled water is anticipated to come on line in 2015 and may benefit some CII customers.

7.4.2.6 Landscape

About one-third of domestic use goes to irrigation. In 2009, JCSD used about 2,839 AF of potable water to irrigate its parks, schools and other irrigation accounts and 710 AF for agricultural activities with non-potable water. JCSD has dedicated landscape meters on all of its parks accounts, golf courses and schools. In addition, medians in the service area are all on dedicated meters. Consumption information is available for all of these users.

The MOU requires that JCSD develop water budgets for 506 of the 562 accounts over the course of ten years. Note that some parks are classified as residential while golf courses are included in industrial uses. Use in golf courses is addressed in the CII section.

Reducing large landscape water uses is a high priority for JCSD. JCSD is already in direct contact with most of its landscape customers and has a dedicated parks division as part of JCSD staff. The JCSD staff has been instrumental in planting drought tolerant species for the landscaping at each park. In addition to JCSD’s commitment, the County of Riverside, adopted and currently amended Ordinance 859 to encourage the use of water efficient landscape. The ordinance established provision for the installation and maintenance of water efficient landscapes, elimination of overspray or runoff, establishing a water budget of 70% of evapotransporation, and raise public awareness.

JCSD will continue to work with customers, identify efficiency opportunities and support implementation through upgrades, rebates, metering or in other ways that are determined to be most effective. Consumption patterns will be closely tracked and communicated with the customer, and water savings will be monitored through the billing system.

7.5 JCSD AB 1420 and SBx7-7 Compliance

JCSD's 2020 SBx7-7 compliance goal is 199 gpcd (Table 7-6) and as of 2009 is currently in compliance with both the SBx7-7 and the MOU target of 203 gpcd with a 2009 per capita demand of 197.6 gpcd. Baseline per capita water use was estimated using the guidelines stated by the MOU and Appendix A of DWR's report "Methodologies for Calculating Baseline and Compliance Urban per Capita Water Use." In order to maintain consistency the SBX7-7 planning process, JSCD has chosen the gpcd alternative for complying with the MOU and Method 1, which is to reduce demand by 20%, to comply with SBx7-7.

Table 7-6
JCSD Compliance Targets

	Baseline (gpcd)	Target (gpcd) by Year		
		2015	2018	2020
MOU/AB 1420	248		203	
SBx7-7	248	223		199

JCSD recognizes the need to expand conservation programs and efforts in order to continue to meet both its SBx7-7 and gpcd requirements in the future.

JCSD is in the process of planning for the hiring of staff to identify and track programs to maintain the gpcd target. Included in the programs considered for implementation are the following:

1. Pricing: By 2012 JCSD will have adjusted the tiered rate structure such that volumetric charges are 70% of total charges. This is expected to have significant impact of Domestic use, especially in the higher tiers. The rate increase enacted in 2008 has already had impact on water consumption.

2. Landscape: JCSD will continue to provide residential and landscape audits to its customers and promote water efficient landscape.

3. JCSD continues to evaluate the use of recycled water for golf courses and has recently completed non-potable water studies to assess the need. Implementation is expected in 2015 with 500 AF of recycled water available.

In addition to these programs, JCSD plans to develop agency coordination to monitor implementation within the service area, program participation and changes in use. JCSD will then have the capacity to adjust programs based on how well they are meeting projected goals.

Section 8: Water Shortage Contingency Planning

8.1 Overview

Water supplies may be interrupted or reduced significantly in a number of ways, such as a drought which limits supplies, an earthquake which damages water delivery or storage facilities, a regional power outage, or a toxic spill that affects water quality. This section of the Plan describes how JCSD plans to respond to such emergencies so that emergency needs are met promptly and equitably.

Of the current supplies, water from the Chino Basin is vulnerable to drought due to the reliance on SWP water and other local surface waters for recharge. SWP water deliveries vary based on the hydrologic conditions of that year. The Chino Basin Watermaster has the responsibility for ensuring the water balance within the basin. The Basin stores 5 million AF and serves 1 million people amongst various purveyors.

Overdraft of the Basin especially in time of extended drought presents a concern for reliability over extended periods of time. In 2009, the safe yield was 140,000 AFY yet 170,000 AF was pumped according to the Watermaster's annual report. Safe yields for the basin have been developed by the Chino Basin Watermaster and serve as the basis for planning and pumping within the Basin. Drought and water shortage conditions ultimately influence the purveyors that utilize water within the Chino Basin.

A Water Shortage Contingency Plan was prepared and presented in the 2005 UWMP and is updated in this section. A more detailed Water Shortage Contingency Plan is in draft form and is anticipated to be finalized and reported on in the 2015 UWMP. In addition, JCSD's Ordinance 317 includes elements of the water shortage contingency plan that are enforceable through the adoption of the ordinance. Prohibitions, penalties and financial impacts of shortages have been developed by JCSD and are summarized in this section.

8.2 Coordinated Planning

JCSD has coordinated efforts in the past to meet water shortages. In 1991, in accordance with the requirements of Assembly Bill 11X, the water, fire, and emergency services departments developed a comprehensive water shortage contingency plan, which was incorporated into JCSD's Emergency Response Plan in early 1992. JCSD's plan is consistent with provisions in the County's Emergency Response Plan. Both plans contain procedures for the distribution of potable water in a disaster; these procedures are consistent with guidelines prepared by the California State Office of Emergency Services.

8.2.1 Water Shortage Response Team

During declared shortages, or when a shortage declaration appears imminent, the General Manager will designate a senior level staff member to serve as chair and to activate the water shortage response team. The team includes: water operations, planning, health, emergency services, public affairs, parks and recreation. During a declared water shortage, JCSD will accept applications or will serve letters but will not issue service letters until the shortage declaration is rescinded.

8.3 Stages of Action to Respond to Water Shortages

Under Ordinance 317, JCSD has developed a four level-rationing plan to be invoked during declared water shortages. The rationing plan includes voluntary and mandatory rationing, depending on the causes, severity, and anticipated duration of the water supply shortage. Table 8-1 presents the four-level rationing and demand reduction targets for JCSD.

Table 8-1

Water Shortage Level and Demand Reduction Targets

Condition	Level	Demand Reduction Target	Type of Program
Drought Watch	1	Up to 10% reduction	Voluntary
Drought Alert	2	Up to 20% reduction	Mandatory
Drought Critical	3	Up to 40% reduction	Mandatory
Drought Emergency	4	More than 40% reduction	Mandatory

Note: During drought levels 2-4, water conservation and use restrictions are subject to penalties.

Priorities for use of available water, based on Section 3 of the California Water Code, are:

- Health and Safety—Interior residential, sanitation and fire protection
- Commercial, Industrial, and Governmental—Maintain jobs and economic base
- Existing Landscaping—Especially trees and shrubs
- New Demand—Projects with permits when shortage declared

Based on the California Water Code, priorities specific to JCSD's service area for use of available potable water during shortages were based on input from JCSD Emergency Response Team and legal requirements set forth in the California Water Code, Sections 350-358. Water allocations are established for all customers according to the following ranking system:

- Minimum health and safety allocations for interior residential needs (includes single family, multi-family, hospitals and convalescent facilities, retirement and mobile home communities, and student housing, and fire fighting and public safety)
- Commercial, industrial, institutional/governmental operations (where water is used for manufacturing and for minimum health and safety allocations for employees and visitors), to maintain jobs and economic base of the community (not for landscape uses)
- Permanent agriculture (orchards, vineyards, and other commercial agriculture which would require at least five years to return to production).
- Annual agriculture (floriculture, strawberries, other truck crops)
- Existing landscaping

• New customers, proposed projects without permits when shortage declared.

Water quantity calculations used to determine the interior household gpcd requirements for health and safety are provided in Table 8-2. As developed in Table 8-2, the California Water Code Stage 2, 3, and 4 health and safety allotments are 68 gpcd, or 33 100-cubic feet (CCF) units per person per year. However, JCSD has approached the health and safety requirement more conservatively. Under Stage II and Stage III mandatory rationing programs, JCSD has established a health and safety allotment of 80 gpcd (which translates to 39 CCF per person per year), because this amount of water is sufficient for essential interior water with no habit or plumbing fixture changes. When considering this allotment and the 2009 population of 87,946, as presented in Table 2-7, the total annual water supply required to meet the first priority use during a water shortage is approximately 8,000 AFY based on an 80 gpcd allotment.

Table 8-2
Per Capita Health and Safety Water Quantity Calculations per California Water Code

	Non-Conserving Fixtures		Habit Changes		Conserving Fixtures	
Toilets	6 flushes x 5.5 gpf =	33.0	4 flushes x 5.5 gpf =	22.0	5 flushes x 1.6 gpf =	8.0
Showers	6 min x 4.0 gpm =	24.0	4.5 min x 4.0 gpm =	18.0	5 min x 2.0 gpm =	10.0
Washers	12.5 gpcd (1/3 load) =	12.5	11.0 gpcd =	11.0	11.5 gpcd (1/3 load) =	11.5
Kitchens	4.5 gpcd =	4.5	4 gpcd =	4.0	4 gpcd =	4.0
Other	6 gpcd =	6.0	4 gpcd =	4.0	4 gpcd =	4.0
Total gpcd		80.0		60.0		37.5
CCF per capita per year		39.0		29.0		18.0

Note: JCSD also has some residences with large lots where some customers have livestock that may require more water than allowed by the California Water Code.

8.4 Minimum Water Supply Available During Next Three Years

The minimum water supply available during the next three years would occur during a three-year multiple-dry year event between 2012 and 2014. As shown in Table 8-3, the total supplies range from approximately 28,942 AFY to 30,887 AFY during the next three years. When comparing these supplies to the demand projections provided in Sections 2 and 6 of this Plan, JCSD has adequate supplies available to meet projected demands should a multiple-dry year period occur during the next three years.

Table 8-3
Three-Year Estimated Minimum Water Supply (AFY)

Water Supply Sources	2012	2013	2014
Water purchased from:			
Supplier produced groundwater	19,442	19,414	16,230
Desalination - Existing CDA	8,200	8,200	8,200
Desalination - Future CDA	0	3,300	3,300
Supplier surface diversions	0	0	0
Current Transfers from Rubidoux	500	500	500
Future Transfers from Rubidoux		1,000	1,000
Exchanges In or out	0	0	0
Other			
Total Potable	**28,142**	**29,114**	**32,598**
Groundwater - Non-Potable (Chino Basin)	200	200	1,057
Groundwater - Non-Potable (Riverside Basin)	600	600	600
Recycled Water (projected use)	0	0	500
Total Non-Potable	800	800	1,657
Total	**28,942**	**29,914**	**30,887**
Potential Production Capacity	41,900	41,900	54,000

8.5 Actions to Prepare for Catastrophic Interruption

8.5.1 General

Riverside County's Emergency Response plan contains procedures for the distribution of potable water in a disaster; these procedures are consistent with guidelines prepared by the California State Office of Emergency Services and have been the accepted procedures for JCSD in case of catastrophic interruption. The greatest threat to JCSD's water supply is a regional power outage likely associated with a major seismic event as the supply is ultimately groundwater whether it is locally pumped or pumped from another part of the Basin. As a contingency to this scenario, JCSD has implemented back-up power at many of their well facilities and at key booster pump stations. However, if there are significant pipeline breakages, operation of the full water system will be limited by the location and the extent of pipeline damage. It is likely that smaller service areas served by individual wells can be valved off and served while more extensive pipeline repairs are performed. Furthermore, each of JCSD's reservoirs totaling 55 million gallons of storage has dedicated emergency water supply equal to

75% of maximum day demand, in addition to supply reserved to meet fire flow, and peak demands. In addition, JCSD has developed an approach to purchase and distribute potable water to its service area (described below).

8.5.2 Water Sources

Potable water distribution sites have been identified for the distribution of water during these events. Standby procurement documents have been developed for emergency bulk purchase of bottled water; standby arrangements have also been made with several local trucking firms to provide tankers to distribute potable water (certified by the California DPH for safe transportation of potable water). All existing water supply storage, treatment, and distribution, and wastewater treatment facilities are now inspected monthly in preparation for such a disaster. In addition, specific water-critical customers (such as hospitals, nursing facilities, schools, and a few individual customers with medical conditions dependent on continuous water availability) have been identified and distribution of water to these water-critical facilities will occur on a priority basis.

JCSD has interties to the Rubidoux CSD and to the CDA as an additional source of water. Although in a regional power outage situation, the Rubidoux CSD and CDA will be subjected to the same challenges since their supply is also groundwater. Emergency storage facilities are located in each of the pressure zones within the service area if groundwater pumping becomes unavailable. Several redundancies including generators, multiple pressure zones, emergency storage and reservoirs, and importing potable supplies within the service region will facilitate the delivery of water to customers in cases of power outages and earthquakes.

In addition to an intertie and distribution of potable water, the following table summarizes the actions JCSD has discussed in preparation for a water supply catastrophe (Table 8-4). Coordination with other agencies and emergency response teams are key elements to the preparative actions JCSD has undertaken.

Table 8-4
Preparative Actions for Catastrophic Interruption

Action	Actions taken
Determined what constitutes a proclamation of a water shortage	✓
Stretch existing water storage	✓
Develop emergency storage facilities	✓
Obtain additional water supplies	✓
Develop alternative water supplies.	✓
Determine funding sources	✓
Contact and coordinate with other agencies	✓
Created an Emergency Response Team/Coordinator	✓
Created a catastrophe preparedness plan	✓
Put employees/contractors on-call	✓
Developed methods to communicate with the public.	✓
Developed methods to prepare for water quality interruptions	✓

8.6 Mandatory Prohibitions During Shortages

In August 2009, JCSD enacted Ordinance 317 (attached as Appendix K), which lists the mandatory prohibitions against specific water activities during times of water shortages, especially during droughts. The prohibitions include specific changes in water use and educational components. The levels are additive and the higher levels of drought response are inclusive of the lower levels requirements (Table 8-5).

Table 8-5
Drought Shortage Plan Action Levels

Prohibition	Level when prohibition is mandatory			
	Level 1	Level 2	Level 3	Level 4
No washing down of paved surfaces	X	X	X	X
Adjust sprinklers and irrigation systems to avoid overspray, runoff, and waste.	X	X	X	X
Irrigate residential and commercial landscape before dawn	X	X	X	X
Use water efficient landscaping	X	X	X	X
Recycled water or non-potable for construction	X	X	X	X
Pool and spa cover installation	X	X	X	X
Use water efficient indoor devices	X	X	X	X
Use re-circulated water to operate decorative fountains, ponds, lakes	X	X	X	X
Use bucket and a hand-held hose with a positive shut-off nozzle, mobile high-pressure/low-volume wash system, or at a commercial site that re-circulates (reclaims) water onsite to wash vehicles	X	X	X	X
Water served upon request at restaurants	X	X	X	X
Residential and Commercial landscape irrigation requirements		X	X	X
No operation of ornamental fountains		X	X	X
Designated residential and Commercial landscape irrigation times			X	X
No filling of pools or aesthetic water features			X	X
No car washing except at commercial car washes			X	X
No new meters (exceptions in ordinance)			X	X
No new annexations to service area			X	
No landscape irrigation except crops and commercial grower products (specific exceptions apply)				X
Leak repair within 72 hours		X		
Repair leaks within 48 hours			X	
All leaks repair in 24 hours				X
Charges in excess of allocations			$5.00/unit of water	$7.00/ unit of water

8.7 Consumptive Reduction Methods During Restrictions

8.7.1 Supply Shortage Triggering Levels

The agencies will manage water supplies to minimize the social and economic impact of water shortages. The Plan is designed to provide a minimum 50 percent of normal supply during a severe or extended water shortage. As the water purveyor, JCSD must provide the minimum health and safety water needs of the community at all times. The rationing program triggering levels shown below were established to ensure that this goal is met.

Rationing levels may be triggered by a shortage in one water source or a combination of sources. Although an actual shortage may occur at any time during the year, a drought shortage (if one occurs) is usually forecasted by the Water Department on or about April 1 each year.

JCSD's potable water sources are groundwater, desalters, and transfers from an adjacent agency. Rationing levels may be triggered by a supply shortage or by contamination in one source or a combination of sources. Triggers automatically implement the more restrictive level. Specific criteria for triggering JCSD's rationing levels are shown in Tables 8-6 and 8-7.

Table 8-6
Water Deficiency Triggering Levels

Level	Percent Shortage
1	5 to 10 percent water deficiency
2	11 to 20 percent water deficiency
3	21 to 40 percent water deficiency
4	Greater than 40 percent water deficiency

JCSDs supply is reliable because of the diverse supply portfolio and due to the various sources of supply, JCSD has prepared contingencies for the various supply reductions as shown in Table 8-7. For example, a Level 1 can be triggered by the criteria in Table 8-6 AND one of the additional 5 criteria in Table 8-7.

Table 8-7
Water Deficiency Stages and Additional Triggering Criteria

Level	Percent Shortage	Current Supply	Future Supply	Groundwater	Water Quality	Disaster
1	5 to 10 percent water deficiency	Declaration of below normal year OR	Projected supply is insufficient to provide 80% of “normal” deliveries for the next two years OR	No excess groundwater pumping is performed OR	Contamination of 10% of water supply exceeding the primary drinking water standards	
2	11 to 20 percent water deficiency	Declaration of below normal year OR	Projected supply is insufficient to provide 75% of “normal” deliveries for the next two years OR	First year of excess groundwater pumping taken must be replaced within four years OR	Contamination of 20% of water supply exceeding the primary drinking water standards	
3	21 to 40 percent water deficiency	Third consecutive below normal year is declared	Projected supply is insufficient to provide 65% of “normal” deliveries for the next two years OR	Second year of excess groundwater pumping taken must be replaced within four years OR	Contamination of 30% of water supply exceeding the primary drinking water standards	Disasterous Loss of System Functionality
4	Greater than 40 percent water deficiency	Fourth consecutive below normal year is declared	Projected supply is insufficient to provide 60% of “normal” deliveries for the next two years OR	Third year of excess groundwater pumping taken must be replaced within four years OR	Contamination of 40% of water supply exceeding the primary drinking water standards	Disasterous Loss of System Functionality

8.7.2 Consumption Limits

JCSD has established the following allocation method for each customer type (Table 8-8).

Table 8-8
Rationing Allocation Method

User Type	Allocation Method
Single Family	Hybrid of Per-capita and Percentage Reduction
Multifamily	Hybrid of Per-capita and Percentage Reduction
Commercial	Percentage Reduction
Industrial	Percentage Reduction
Governmental/Institutional	Percentage Reduction
Agricultural/Landscape-Permanent	Percentage Reduction - vary by efficiency
Agricultural/Landscape-Annual	Percentage Reduction - vary by efficiency
Recreational Percentage	Reduction - vary by efficiency
New Customers	Per-capita (no allocation for new landscaping during a declared water shortage.)

Based on current and projected customer demand, water will be allocated to each customer type by priority and rationing level during a declared water shortage. Individual customer allotments are based on a five-year period or as much data are available. This gives JCSD a more accurate view of the usual water needs of each customer and provides additional flexibility in determining allotments and reviewing appeals. However, no allotment may be greater than the amount used in the most recent year of the five-year base period or as many years as data are available.

The Operations Manager shall classify each customer and calculate each customer's allotment according to the Sample Water Rationing Allocation Method seen in the above table. The allotment shall reflect seasonal patterns. Customers shall be notified of their classification and allotment by mail before the effective date of the Water Shortage Emergency. New customers will be notified at the time the application for service is made. In a disaster, prior notice of allotment may not be possible; notice will be provided by other means. Any customer may appeal the Operations Manager’s classification on the basis of use or the allotment on the basis of incorrect calculation.

8.7.3 New Demand

During any declared water shortage emergency requiring mandatory rationing, JCSD recommends that City and County building departments continue to process applications for grading and building permits, but not issue the actual permits until mandatory rationing is rescinded. In Stage 3, it may be necessary to discontinue all use of grading water purchased from JCSD, even if permits have been issued, and banning all use of water for non-essential uses, such as new landscaping and pools.

8.8 Penalties for Excessive Use

In August 2009, JCSD's Board of Directors adopted Ordinance No. 317, which addresses water conservation, shortage, drought, and emergency response procedures. JCSD's Water Conservation Ordinance states that no water user shall waste water or make, cause, or permit the use of water for any purpose contrary to any mandatory provision of Ordinance No. 317, or in quantities in excess of the use permitted by the conservation level in effect. If excessive use (water leaks and/or waste) is detected from any water user, the following enforcement plan will apply to Water Conservation Stages 2-4.

- Any person who uses, causes to be used, or permits the use of water in violation of this ordinance is guilty of an offense punishable as provided herein.
- Each day that a violation of this ordinance occurs is a separate offense.
- Administrative fines may be levied for each violation of a provision of this ordinance as follows:
    - One hundred dollars ($100.00) for a first violation.
    - Two hundred dollars ($200.00) for a second violation of any provision of this ordinance within one year.
    - Five hundred dollars ($500.00) for each additional violation of this ordinance within one year.
- Penalties collected shall be used to benefit disadvantaged communities in JCSD.
- Violation of a provision of this ordinance is subject to enforcement through installation of a flow-restricting device in the meter.
- Pursuant to Water Code Section 377, each violation of this ordinance may be prosecuted as a misdemeanor punishable by imprisonment in the county jail for not more than thirty (30) days or by a fine not exceeding one thousand dollars ($1,000.00), or by both.
- Willful violations of the mandatory conservation measures and water-use restrictions as set forth in Article 7.0 and applicable during a Stage 4 Drought Emergency condition may be enforced by discontinuing service to the property at which the violation occurs as provided by Water Code Section 356.

8.9 Financial Impacts of Actions During Shortages

All surplus revenues that JCSD collects are currently used to fund the Rate Stabilization Fund, conservation, recycling, and other capital improvements. JCSD estimates projected ranges of water sales by shortage level to best understand the impact each level of shortage will have on projected revenues and expenditures by each shortage level and the need for funds to meet any revenue shortfalls during a shortage condition.

8.10 Mechanism to Determine Reductions in Water Use

Demand

JCSD bills their customers on a monthly basis. The prior year's consumption is included on most customer bills. This allows comparison of the total consumption from each billing period to the same billing period from the prior year.

Production

Under normal water supply conditions, potable water production figures are recorded daily. Totals are reported weekly to the Operations Manager and incorporated into the water supply report. Water in storage is one of the production numbers that can be useful, especially during a catastrophic event.

Stage 1 and 2 Water Shortages

During a Stage 1 or Stage 2 water shortage, daily production figures and water in storage are reported to the Supervisor. The Supervisor compares the weekly production to the target weekly production to verify that the reduction goal is being met. Weekly reports are forwarded to the Operations Manager. Monthly reports are sent to the Board of Directors. If reduction goals are not met, the Manager will notify the Board of Directors so that corrective action can be taken.

Stage 3 and 4 Water Shortages

During a Stage 3 water shortage, the procedure listed above will be followed, with the addition of a daily production report to the Manager. JCSD will continue to monitor the supply, water in storage, and demand in the service area.

Disaster Shortage

During emergency shortages, production figures are reported to the Production Supervisor hourly and to the Operations Manager daily. Daily reports will also be provided to the Board of Directors.

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